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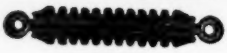

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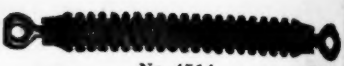

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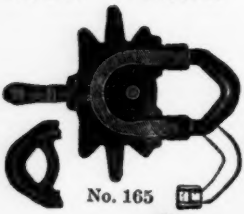

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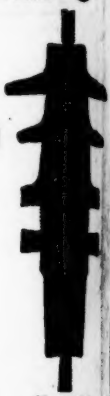

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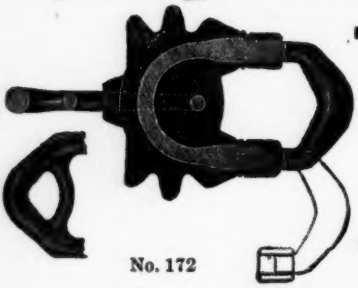

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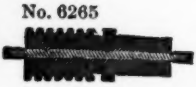

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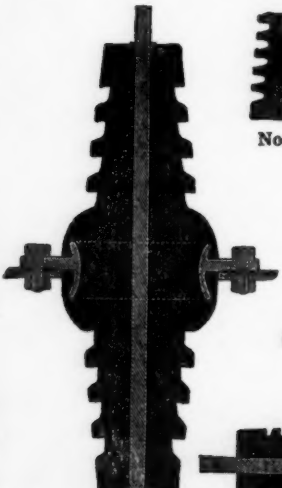

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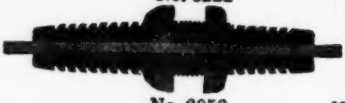

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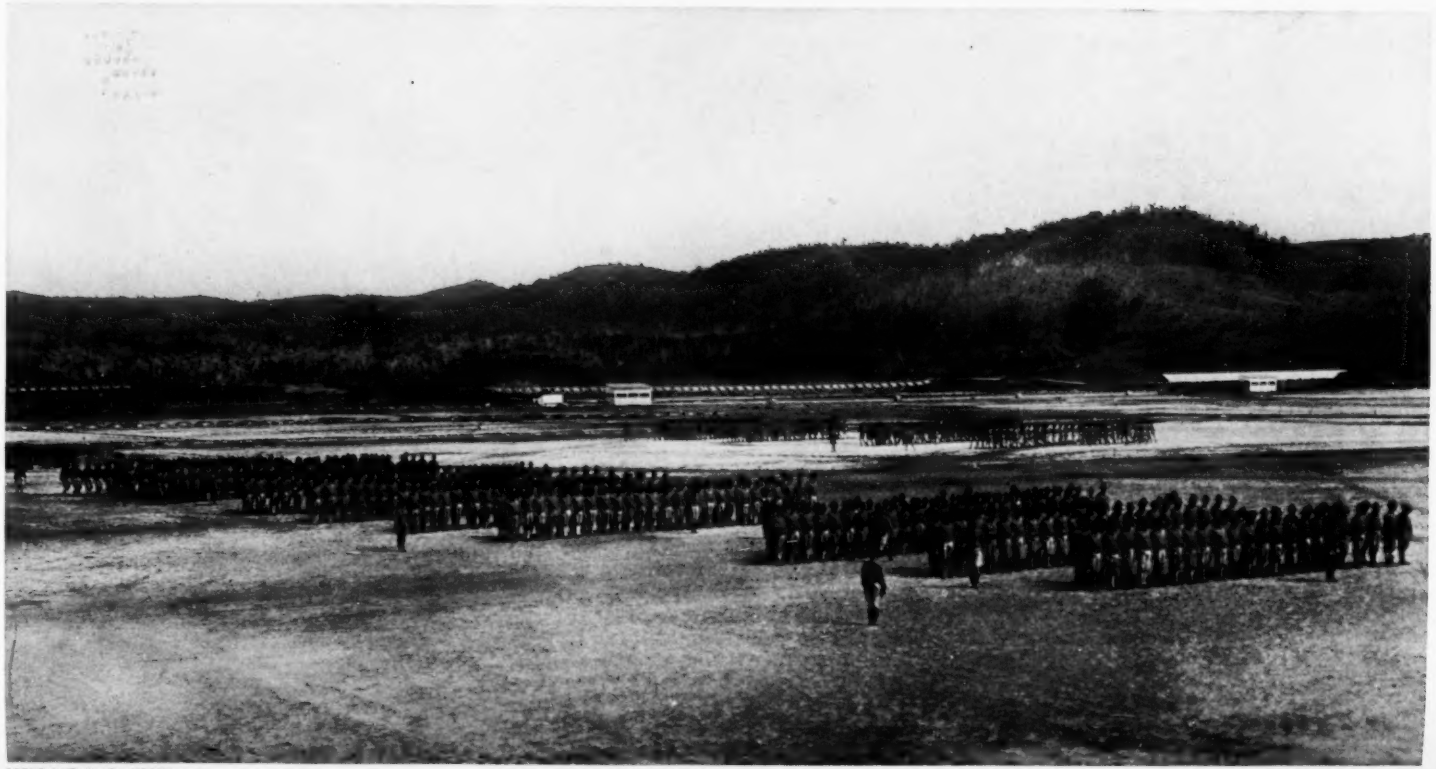

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THE SUBMARINE

By COMMANDER YATES STIRLING, U. S. Navy

I. TYPES

Sealing up a vessel in order to submerge it was accomplished many years ago. The early attempts succeeded in producing submarines capable of operating on the surface with small buoyancy, or else sliding along the bottom with negative buoyancy. It was not until the early eighties that a vessel was designed which might be said to have been successful in navigating between the surface and the bottom.

The history of the development of the modern submarine is closely connected with the development of reliable methods of propulsion for a type of vessel designed to travel both on and under the surface of the sea.

As regards hull construction, two distinct types have been developed; the single-hull type being the original conception. The double-hull type was designed in order to gain high surface speed on a moderate length.

The early submarines of the American-Holland type were single-hull vessels. The hull was in the shape of a spindle, largest diameter in the middle, narrowing toward the ends; water ballast was admitted into tanks contained within the spindle hull. After the vessel had been submerged with but small buoyancy and was traveling at the surface, a single stern diving rudder was used to cause the vessel to "dive." Once the bow went under, the forward deck acted as a hydroplane, and the vessel dove beneath the

surface. Leveling at any desired depth was accomplished by means of this diving rudder. Considerable inclination could be used in submerging the early vessels of this type. As tonnage increased, and in consequence the length of vessels increased, a pair of bow diving rudders were added. These were operated together with the after diving rudder, permitting submergence at a small angle of inclination. Three degrees is the maximum angle usually reached by vessels of the single-hull type so fitted in ordinary smooth water work.

When it is desired to have high surface speed without unduly increasing the length of the vessel, surface buoyance becomes important. Increased surface buoyancy was accomplished by working a hull outside of the central spindle hull. In certain designs this outer hull was only partial, while in others it was run the entire length of the vessel. A submarine with this double-hull construction is usually termed a submersible.

The submersible is operated in a similar manner to a submarine (single-hull type). In addition to bow and stern diving rudders, hydroplanes are sometimes fitted. This type appears to submerge on a level keel, but actually from two to three degrees of inclination is reached.

The single-hull type may be considered a vessel primarily designed to run below the surface of the sea. The form of hull and the small increased amount of wetted surface over that in the light condition gives efficient submerged qualities. The double-hull vessel or submersible, on the other hand, being designed for high surface speed (increased surface buoyancy and surface underwater lines) is primarily a high-speed surface vessel capable of submerging at will.

TABLE I

COMPARISON OF THE TWO TYPES

	Single Hull	Double Hull
Length over all	173′	197′
Surface displacement (tons)	485	485
Net submerged displacement	593	643
Gross submerged displacement	655	750
Net buoyancy—% of surface displacement	22	33
Net buoyancy—% of submerged displacement	18	25
Shaft horsepower for 14 knots	800	850

Net submerged displacement is exclusive of superstructure, from which it is not possible to expel water when submerged.

Gross submerged displacement includes superstructure, etc. Net buoyancy means the difference between the surface displacement and the net submerged displacement, and represents the buoyancy on the surface created by expelling water from the ballast tanks.

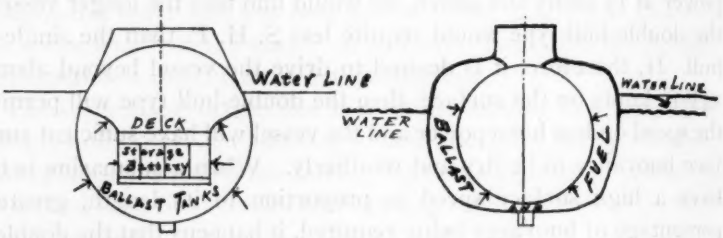
In the table is shown an actual comparison between a single-hull vessel and a double-hull vessel of the same surface displacement. The double-hull vessel has 50 per cent more buoyancy on the surface and therefore will be drier in a seaway. The power required to drive the double-hull at the moderate speed of 14 knots is more than that required to drive the single-hull—the wetted surface of the double-hull is greater. However, if we could obtain the horsepower at 15 knots and above, we would find that the longer vessel, the double-hull type would require less S. H. P. than the single-hull. If, therefore, it is desired to drive the vessel beyond about 14½-15 knots on the surface, then the double-hull type will permit the speed on less horsepower and the vessel will have sufficient surface buoyancy to be dry and weatherly. When a submarine is to have a high surface speed in proportion to its length, greater percentage of buoyancy being required, it happens that the double-hull type will give this requirement and the tankage system can be arranged more readily by utilizing the compartments in the outer hull for both fuel and ballast. It has been thought that the dividing line between the two types was a question of tonnage; that is, beyond 600 tons the double hull was necessary; this is not so. It may happen that for certain requirements a double hull may become necessary, for reasons of stability, in a vessel of small tonnage. From a structural standpoint a single-hull vessel of 1000 tons is simple enough, provided moderate speed only is desired.

As to stability, the double-hull type has comparatively large surface stability, combined with comparatively small submerged stability, while the contrary is the case with the single-hull. The single-hull type must therefore have a more comfortable motion at sea, and where buoyancies are equal it is a better sea boat. The maximum righting moment of the single-hull type submerged is when the vessel is inclined at 90 degrees. In the double-hull type the center of gravity is usually higher than in the case of a single-hull of circular or elliptical cross section—when totally submerged

the position of the metacenter is usually low. In all types of submarines, the center of gravity must be below the center of buoyancy when the vessel is submerged.

The United States and England have in the past given preference to the submarine or single-hull type. Both the Holland and Lake designs are of this type. The Lake boats have a large superstructure, part of which is water-tight (not pressure-tight), and use hydroplanes when submerged in addition to diving rudders.

Foreign submarines designed by Laubeuf (France), Laurenti (Italian), and the Germania-Krupp (German) are double-hull vessels. In Europe high surface speed was sought without going



Single Hull, *Holland* Type. Outside hull and ballast. Tanks will stand a pressure of 88 lbs. per sq. in.

Double Hull, *Laubeuf* Type. Inner hull only a pressure hull.

AMIDSHIP SECTIONS

to extreme lengths of hull. From the surface standpoint only the most striking advantage of the submersible is the large reserve of buoyancy, giving ample deck space for the crew.

II. MACHINERY

Successful surface propulsion arrived with the development of the internal combustion engine. This engine and the electric storage battery, driving motors, formed an excellent combination of propulsive agencies.

An engine for a submarine represented a difficult problem in internal combustion engine engineering, and this is the reason why so many years elapsed before a reliable engine was produced. In every case where another type of engine has been used, the reason has been that satisfactory internal combustion engines could not be obtained.

A satisfactory and therefore reliable internal combustion engine is the natural and logical submarine engine. Using these engines for quick submergence it is only necessary to stop the engines and close the valves in the exhaust piping to prevent flooding the cylinders with salt water; the boat then is ready to submerge in so far as the engines are concerned. Furthermore, but little heat is radiated from the engines themselves. This is a matter of considerable importance to the comfort of the men in the engine-room. Also, as all submarines have motor-driven cooling water pumps, these can be run to further cool off the engines after submerging.

Compared with a steam equipment, which has been considered in order to obtain high surface speed, there is very little heat radiated from the engine itself, for the reason that cylinders and such parts of the engine which naturally become hot are water-jacketed outside, and the temperature of the jacket water seldom rises to over 100 degrees. In addition, the great amount of air constantly required for the engines keeps the engine-room cool and well ventilated.

The fuels for submarines are gasoline, gas engine oil and fuel oil. In the later submarines, the heavier fuel oil will be used to the exclusion of the lighter gas engine oil. An internal combustion engine, such as the Diesel, for a given power, uses only one-third as much fuel oil as does a steam engine plant. This is a most important point to be considered in deciding upon engines for warships.

The first submarines built for the United States Navy were equipped with gasoline engines; they were of 160 horsepower. The last boats to be built with gasoline engines were the "D" class.

Gasoline, on account of its volatile nature, is not a desirable fuel for a submarine engine, but until 1909-10 no engine builder in this country had attempted to build a Diesel engine suitable for a submarine boat. The first Diesel engines were installed in our submarines of the "E" and "F" classes. These engines were of the four-cycle non-reversible type, built in this country after foreign designs. Two years later, 1913-14, a demand for a higher surface speed was met by the installation of two-cycle Diesel engines in the "H" class.

In order to appreciate the difficulty in the development of a new type of engine, it should be understood that we allow from 18 months to two years to build a submarine; after commissioning, at least a year must pass before any definite conclusions can be drawn. At all events, actual accomplishment is at least two to three years behind what is considered the best design.

Our submarine engine development actually went ahead of the ability of personnel to run successfully. The experts from the engine builders obtained only occasional good results with the two-cycle engines until after numerous faults had been corrected. These faults, for the most part, could not be foreseen by the designers; it was necessary to discover them one by one in actual running of the engines under the trying conditions of service.

The consequence of faults in the two-cycle engine has caused a return to the four-cycle.

The use of two engines tandem on each shaft has not been an unqualified success in our navy; due to using the after engines practically all the time, the bearings of those engines in time become lower, and when the forward engines were connected the shafting was found out of line. It has the advantage that one pair of engines can drive the ship to about three-quarters of the full speed. Therefore, in cruising, the after engines can be used and at sufficient load for economy, yet not under severe enough stress to cause undue wear and tear.

If, while running on the after engines at moderate speed, it is desired to go at full speed, the after engines will be brought up to their full speed, and meanwhile the forward engines will be started up without load and then the clutch between the two engines thrown in. By this means no time is lost in stopping to connect engines together.

The storage batteries and motors are ideal for submerged propulsion. They require no air, are noiseless and leave no tell-tale wake behind. In addition, the storage battery supplies power to pumps, steering gear, air compressors and the motors of the ventilating system, besides lighting the vessel throughout. The storage batteries in the first classes of submarine were not as reliable, nor could they be given the intelligent care and attention that batteries to-day in our submarines are receiving. The submarine battery has progressively developed, and to-day gives but little to worry over.

Motor trouble has been one of insulation mostly. The oil saturated atmosphere of a submarine is an efficient searcher after defective insulation.

III. OPERATION

From the standpoint of operation, a submarine must be capable of submerging quickly and expelling its ballast quickly. This is an important consideration in design. In the single-hull type the main ballast tanks, inside the pressure or spindle hull, are divided usually into three tanks, each flooded and blown separately. In the double-hull type, what corresponds to the main ballast tanks are in the outer hull.

The time to flood depends upon the exit opening for water, and the time to expel depends upon the above and also the means employed to expel water. Rotary pumps, motor driven, are used and also low-pressure air compressors, discharging the air into the tanks direct. Pumps or air compressors capable of expelling eight tons of water per minute are said to be installed in modern European submarines.

Before submerging, a submarine of either type must get its longitudinal trim. That is, before admitting water to the main ballast tanks, assurance must be had that the vessel has longitudinal stability; when at rest with ballast tanks full of water, the vessel should be on a level keel. The reason for this may be readily understood when it is realized that as reserve buoyancy diminishes, longitudinal stability falls in an alarming ratio. If with 13 tons of reserve buoyancy we express the longitudinal stability by 100, then:

TABLE II

Reserve buoyancy	Longitudinal stability
6 Tons	73
3½ "	27
800 pounds	7

In the most up-to-date submarines in Europe, automatic compensating fuel tanks have been installed. Water is forced into the fuel tanks as fuel is used, always keeping fuel tanks full of liquid. The only allowance to be made in getting trim is the difference in weight between water and oil; this can be quickly computed and corrected by means of small trimming tanks. In submarines not

fitted with such methods of compensation, trim must be actually obtained by trial before each submerged run, else adjusted while submerged from information from the horizontal steering, a none too safe method. The final act, in totally submerging both types, is accomplished by admitting water into strong pressure tanks located amidships (longitudinal center of gravity) called auxiliary or diving tanks.

Submerged speed and submerged radius of action. The former is dependent upon capacity of battery and motor power, and the latter upon capacity of battery and design of motors. A submarine must submerge immediately upon sighting a ship. If it does not, the ship will discover the submarine and the advantage of surprise will be denied it. A submarine submerged can hardly hope to overtake even the slowest surface vessel unless the latter steers more or less toward the submarine. For this method of attack a high submerged speed for a limited time is desirable. Submerged radius is required to submerge at a long distance from a fleet, and while submerged, doing the greatest amount of damage and then still submerged escape from a chase by surface vessels. In hazy and thick weather, in close proximity to enemy warships, a submarine for successful attack may desire to run submerged for eight or ten hours and still have sufficient battery capacity remaining for a spurt attack.

Surface speed for a submarine is not important in attack at all. On information from scouts it can use high speed to obtain a position ahead of an advancing enemy, but immediately it sights the enemy this high speed cannot be used. A high speed engine, furthermore, is usually one of less reliability than a moderate speed engine.

Very high surface speed can be obtained by going to great length and a double hull for surface buoyancy. So much space is required for engines and engine auxiliaries that battery space cannot be proportionately increased; the result must be slower speed submerged and less radius submerged than is desirable.

If the engines become inoperative the submarine is useless, for it depends upon its engines to recharge its batteries, and these are the source of all power. This vital fact counsels a reliable submarine engine and should cause designers to hesitate in reducing engine weight per horsepower in order to obtain an elusive knot or more surface speed.

IV. DESIGN

It must be remembered that high surface speed is antagonistic to the submerged qualities of a submarine. High speed in surface vessels is accomplished by great length. A submarine of great length while submerging and when submerged is tender longitudinally (see Table II). In order to keep length moderate, large reserve of buoyancy is supplied. This design will be a quick roller. On account of the large water plane surface the metacenter is some distance above the center of buoyancy, and shifts its position with change of angle of transverse inclination; the result is large metacenter height in surface trim. Another point to be considered is, while going from the light to the submerged condition, the center of buoyancy rises and the center of gravity sinks (unless much ballast is carried in top tanks when center of gravity may change its position but little). Metacentric height therefore diminishes; in some double-hull designs it becomes zero and sometimes even negative.

In recent German submarines the top tanks in the double-hull are much flatter and in some cases are non-water-tight. Even this non-water-tight top tank or superstructure contributes to surface buoyancy, and does not raise the center of gravity upon submerging. It also gives the vessel less metacentric height on the surface and proportionally increases her sea-going qualities in making her steadier in a seaway.

Reserve buoyancy is limited in the single-hull design. For a vessel of about 1000 tons surface displacement, the limit is reached when about 25 per cent buoyancy of the surface displacement is provided. This means that 250 tons of water ballast is taken for total submergence. Double-hull vessels are given as high as 50 per cent of reserve buoyancy, and is necessary, of course, if the vessel is to be driven at high speed in rough weather. If the vessel was one of 1000 tons surface displacement, there would be 500 tons of water ballast to be taken in upon submerging.

The double-hull vessel probably can carry a greater supply of fuel oil, as this is carried in outer tanks. Buoyancy can be temporarily sacrificed if necessary for the purpose. This is likewise possible in the single-hull type, only a greater proportion of buoyancy will thus be sacrificed, which might not be safe.

Characteristics will influence size to such an extent that many have fallen into the habit of considering size a characteristic in

itself. The submarine hull designer actually starts his calculations with the amount of net submerged displacement he can have. Then he looks up the surface speed desired, and the length the vessel is to be. From this, reserve buoyancy necessary is worked up and then after subtracting, he has the surface displacement. The higher the buoyancy the smaller the weight the designer has at his disposal to put into the hull, engines, batteries, motors, torpedoes, etc. The characteristics that suffer most with large reserve buoyancy are submerged speed and radius, for the reason that additional displacement and wetted surface must be pushed through the water.

We must first of all determine how we intend to employ our submarines. Until we do that no intelligent decision can be made as to type or tonnage, surface speed or submerged speed, etc. Do we intend concentrating our submarines at a point threatened by an enemy or keeping a certain number at many points along our expansive littoral, giving up the idea of concentration? Shall we use them merely to lie in wait near our coast until an enemy stumbles upon them, or give them the seagoing qualities and radius to travel considerable distances; to seek the enemy? Tactically, shall we consider that submerged speed and radius need not be large, or shall we give our submarines the power to travel far submerged, both in time and distance? After we are decided upon these important points, then we shall be prepared to say what type we need.

Another point in design is worth considering, especially is this true for a submarine. The design may fulfill the requirements of speed, surface and submerged, reserve of buoyance, armament, storage, berthing, stability, operation, etc., and yet the submarine may be so overcrowded with machinery, torpedoes and men as to leave no space for overhaul or work in preparation for battle. The designed hull may fit as tightly as a glove. This is the case in many submarines in service. Furthermore, reliability, a factor depending both upon matériel and personnel, is difficult to write in a specification and is frequently sacrificed to gain higher speed. To insure space and reliability some desire to go so far as to state what shall be the minimum surface tonnage and the minimum weight of machinery per horsepower. It must be realized, however, that by so doing the designer may find himself unnecessarily

handicapped without our gaining a material benefit. Careful co-ordination in design and frequent interchange of views between designers and operators may produce the desired result.

V. DEVELOPMENT

The first submarine Diesel engine turned over to the naval personnel to run was in 1912. They were built from German designs. From this date until the present, the marine Diesel engine in America has been progressively developing—rather too rapidly for the limited personnel supplied the submarine service. The advance from the four-cycle to the two-cycle did not turn out a success. In the meantime several Diesel engine firms in this country developed very reliable four-cycle Diesel engines, and these types are to be installed in future submarines. When appropriate means have been found to carry off the heat from pistons and wrist pins of the two-cycle type, then the navy may return to that more-advanced machine and even to the double-action engines which are now under investigation and experimentation. If the high surface speed submarines continue to be considered a necessity, the demand will force the adoption of an engine which will develop more horsepower for its weight and size than does the four-cycle Diesel. Steam propulsion offers so many difficulties that the idea, although advanced and taken up by commercial firms, never got beyond the sketch stage.

While on this subject of development of submarine Diesel engines, a word for the navy personnel. The officers and men had already learned through sad experience the many difficulties encountered in helping to develop a new type of engine, the internal combustion engine—gasoline explosive engines. With this experience they went to boats in which Diesel engines of much less reliability were installed. They then had to learn a new type of engine and continue to help the designers develop it into a reliable submarine engine. This they accomplished through many breakdowns, often at inauspicious times. That the designers in this country have finally reached a reliable four-cycle engine for submarine use is largely due to the work of this handful of navy men; although during that painful interregnum when engine parts were being broken faster than spares could be turned out by the contractors, neither side was willing to concede anything to the other.

In overhauling engines in submarines, the very limited engine-room space available was a very difficult handicap; the designer was limited in space and he took as much as he thought necessary; the need of more room to overhaul machinery finally won recognition.

In addition to engine trouble, storage battery difficulties came to bring added anxiety to the submarine personnel. The battery itself was sufficiently reliable; the greater trouble was experienced in the installation. It had to go inside a definite space and was assembled and put together in the boat and usually by men without sufficient expertness. The navy in the beginning did not possess men with expert knowledge in the care of storage batteries. They learned through experience, and when the personnel must learn in this difficult school, matériel naturally suffers.

With all the defects in motive power to contend with, hull defects added their mite. Some of these were due to design; to material used; but many more were attributable directly to an undeveloped system of hull overhaul. In addition, hull development was applied to the active submarines, requiring long periods at navy yards for necessary alterations.

During this transitory period the school for the submarine personnel was in the active flotilla; nowhere else could the officers and men learn the intricate machine which had been given them to operate.

No mention has been made of the weapon of the submarine—the torpedo. The battleship, during this stage, with ample space at its disposal in large and commodious torpedo-rooms, could not boast of great success; how much less chance had the submarine with practically no space for overhaul and fully occupied as it was in making a successful surface vessel out of itself.

The cycle of the submarine endeavor at that time was surface running, training in submerging, firing torpedoes, then overhauling everything, using inadequate facilities. Commanding officers (there was at this time only one officer in each vessel) had no time at their disposal for the study of the tactics and strategical qualities of their vessels, much less for their demonstration.

A submarine submerged is blind. At the surface it is enabled to see by means of its periscopes. The periscope is then the submarine's eye. We all understand the disadvantage of poor eyes. Our submarines have suffered considerably from this very vital

defect. A submarine operating in the vicinity of surface vessels, especially in maneuvers with other types of warships, is at a great disadvantage if its eyesight is poor. The fact gives the personnel a persistent feeling of insecurity, and makes them prefer to keep to themselves.

The air within a submarine submerged for any length of time becomes exceedingly foul. Odors of acids, perspiration, men's breaths, etc., add their poisons to the air. There are many systems in use to purify the air of submarines. Some have been experimented with, but up to date none have been adopted and used as a standard type.

The navy uniform for submarines is the same as for the rest of the service. It has been demonstrated inadequate in cold weather. It is none too suitable in any weather. For winter operating, leather or some wind-shield substitute is required.

There remain many other features important to the submarine. In the development the big and more important defects have received first treatment. Others must bide their turn. Progress will be more rapid after the principle of "undivided attention" has been accepted, and the matériel and personnel administration in upkeep and development co-ordinated under a single head.

Two firms have built practically all the submarines for the United States Government. The designs were furnished by the builders and approved by the bureaus of the Navy Department concerned. In some cases the operating personnel was consulted, but oftentimes the head of the submarine force was beyond reach and to consult him would delay the awarding of contracts. Characteristics were laid down by the Navy Department and incorporated in the specifications and plans. The interest of the builders was toward standardization in design and size. The Navy Department desired each class to be a distinct improvement over the previous one. It would have been better to have effected a compromise, as was done in England from the beginning of submarine development; lay down one advanced type with all improvements installed for test and repeat the advanced type of the year before. This single vessel each year to be rushed to completion in order to try it out in service before laying down duplicates. This excellent practice could be put into effect with the three 800-ton vessels appropriated by the last Congress.

VI. DIFFICULTIES

Until the war in Europe focussed attention to the very great usefulness of an efficient submarine vessel, scant attention, even respect, was paid to the submarine and the personnel working it. Many high ranking officers considered the duty a waste of time and advised young officers in whom they took a personal interest to keep out of it. A great majority of young officers take their cue from the older and more experienced; in consequence, the feeling throughout the service, especially in the Navy Department, and on board the large ships, was not friendly.

The bureaus complained of the very large cost of upkeep. Engine spare parts are expensive, and a vast quantity of valuable battery material was destroyed or ruined in casualties, some of which were due to inexperience or inexpertness of personnel. The repairs to the hulls require workmen most expert; this quality of work is high priced. The question was asked frequently by those having cognizance of the money expenditures: "Are submarines worth their keep?" Submarines were particularly annoying to the trial boards, due to frequent failures to make the required speed tests, necessitating delays.

The submarine's crew, when not operating, should be quartered where they can obtain plenty of sunlight and fresh air. The machinery requires the almost constant use of a machine shop. Space is almost constantly demanded to overhaul storage battery cells, to assemble new cells; and facilities to boost cells, to replace others. Torpedoes require a place for general overhaul outside of the boat, in order that the vessel meanwhile may maintain its submerged training. These fundamental requirements had been supplied, but as the flotilla grew, tender facilities lagged behind; the navy personnel was short of men to fully man vessels in commission. The complement of a submarine tender was found to equal the total crews of the submarines tended. This was an enormous overhead charge to pay for vessels which were not considered to be capable of important naval work.

The quality of the personnel itself was attacked; it was blamed for a condition that was not of its choosing. Officers and men were ordered to submarines in just the same way as to surface vessels; that is, without any regard to previous training or fitness. Many volunteered for the duty, and as applications were not very

numerous, most of these were accepted and ordered. Even though the duty was known to be exacting in hard work, there were compensations acceptable to young healthy men; greater responsibility for rank, less rigid formalities of the service, watch standing only at sea, and an assurance of remaining in the country. These men blazed the way for others to follow, and they received mostly hard knocks in doing it. Their experiences have proved the importance of developing the submarine as a separate branch of the navy.

In any military service, rank is always an important factor. Rank had always been denied the submarine.

Probably the worse feature of submarine service occurs when a submarine is obliged to go to a navy yard for overhaul without its tender. This occurs very frequently. It is assigned a berth in the same way as would a vessel capable of housing its own crew, for instance, a destroyer. The crew are assigned berths or billets on board the receiving ship, usually some distance away from the location of the submarine. The submarine crew at once chafe under receiving ship discipline. The character of their work keeps them in dungarees all day. When they return to the receiving ship they feel the implied, though not always expressed, hostility of petty officers, and sometimes officers, towards them for being dirty themselves and for dirtying decks or paint work. The officers put up with greater discomforts; they are required to keep up their paper work without yeomen or office facilities. They must beg or borrow the use of machine tools. Altogether the conditions are most trying and are not conducive to a close co-ordination of effort. Rather than go to the receiving ship a custom has grown up to "board around" on board destroyers where the atmosphere is congenial.

This attitude of mind is characteristic of the navy. Many can remember the open hostility between the deck and engineers. The war has raised the submarine higher in the navy's opinion; however, the submarine service knows it cannot flourish while mixed in the stew with other types. It is as distinct as an aeroplane and far more difficult to run efficiently. The aeroplane is to have its distinct and separate organization. Is our submarine service of less importance to the country?

VII. Bases and Tenders

The machinery and outfit of submarines is so vastly different from those of other warships that facilities for repair and upkeep should be separate from that of surface vessels. This has been demonstrated at every stage of their development.

If our submarines are to be of a mobile type, but few separate bases are needed, located at strategic points. For operations in distant areas sufficient tenders are required.

At these bases schools of instruction and training should be located. It must be remembered that we shall require a large number of trained officers and men to man even those submarines already provided, and the prospect is for large additions in the future. Previous training will avoid many of the difficulties experienced in the past.

All officers and men on duty with aeroplanes are now considered on sea duty. How much more justly this rule should apply to the personnel on duty with submarines, even though they may be living ashore except when actually operating. The duty in submarines is sea duty of the most arduous kind and cannot be made continuous for that reason. Nations at war keep double crews for each submarine.

VIII. Strategy

Command of the sea is a term employed during a war to define the naval power of a belligerent which by means of its more formidable sea power is able to use the sea with reasonable security and deny it absolutely to its enemy.

In the past the instruments of sea power have consisted of surface warships. New instruments now exist—the aircraft and the submarine. Air power can be overcome by superior air power. Undersea power cannot be overcome by undersea power alone. To destroy this new power, fast surface vessels and aircraft offer the best chances of success.

Command of the sea includes the control of the surface of the sea. This control prevents surface craft of an enemy using the sea. This is the first essential step to the destruction of undersea power. In this latter work many speedy vessels are used, armed with rapid-fire guns, mines and submarine nets and accompanied by aircraft; it resolves itself into a hunt for a type of vessel that

can in an instant disappear from view and appear again miles away, or else can remain in the vicinity of discovery with but a single, almost invisible, eye above water, ready to launch a torpedo at the vessels engaged in the search.

The submarine makes long passages on the surface. It submerges so as not to betray its presence. Submerged radius is but a very small percentage of its total radius of action. Submerged radius, however, can be regained after being used by recharging batteries.

The origin of most wars between nations is commercial. The naval aim in war is the command of the sea. By the sea the sinews of war are to a large measure obtained. To this end the enemy's fleet is the point of attack. The destruction of the enemy's sea power usually decides the war in favor of the victor.

If one belligerent is inferior in surface vessels to an extent insuring defeat if it meets the enemy fleet, then that belligerent concedes command of the sea temporarily to the enemy.

The submarine is the weapon of the weaker belligerent. It continually points a dagger at the heart of the stronger fleet; provided that fleet actively enjoys its command of the sea.

The stronger belligerent, the one commanding the sea and controlling the surface, will hesitate to send its vital ships to sea in face of the menace of the enemy's undersea power, unless its margin of superiority is very great.

We are thus brought to this condition: Two belligerent naval powers each with formidable surface fleets, holding them in port, fearing in the case of the stronger, the enemy's undersea power and in the case of the weaker, the enemy's surface power.

The dispute for the command of the sea now begins; the stronger belligerent using surface warships only, the weaker, submarines only. Meanwhile the great fleets of capital ships remain spectators to the struggle of their champions, the one to maintain the security of the sea for their vessels and the other to destroy it. One can readily understand the necessity of the most effective submarine type for a weak sea power.

Against a convoy of merchant vessels, transports, and auxiliaries and against a large fleet of warships in passage across several thousand miles of sea where fuel in all types must be economized by steaming at reduced speeds, the submarine offers itself as a most effective offensive weapon.

A nation weak in capital ships and therefore unable to maintain a threatening naval force upon the flank of an advancing enemy should be able to rely upon an effective submarine offensive. With mobile types a dangerous sea area can be made for an enemy. When he enters this area he will be navigating in the vicinity of numerous uncharted rocks—the submarine. If the weaker nation owns high-speed battleships, capable of tracking an enemy fleet without being brought under superior gun power, these submarines can all be concentrated upon the enemy.

IX. TACTICS

Tactics deal with the actions of submarines in the presence of an enemy. Upon sighting an enemy the submarine must submerge. Surprise makes up for its lack of high speed when submerged. It must be capable of submerging quickly. It should be able to observe the enemy without discovering its own presence to the enemy by surface commotion. It must have a good clear pair of eyes to see distinctly, and it must be armed with weapons capable of destroying the largest enemy with a single hit. Speed submerged is a necessity for successful attack; the submarine must reach a range where a miss is impossible, for the number of its torpedoes is necessarily limited. Radius submerged, in time or distance, should be large, to permit the submarine to continue its attack as long as necessary and afterwards to escape from chasing vessels.

A submarine cannot be blockaded in port unless the water should be too shallow for it to totally submerge. The battleship and other warships of moderate speed must be continually on the lookout for the wake of a torpedo, and they will be unable to avoid the blow if truly aimed. The speedier warships must utilize their high speeds to insure safety, yet there will be times when they will be caught at slow speeds or stationary by a roving submarine.

With the development of the offensive submarine, nations with surface fleets will hesitate to claim full command of the sea.

Tactical principles of concentration apply equally to submarines. The radio can direct a concentration of submarines as readily as it can direct destroyer concentration.

The menace of the submarine has already surrounded a battle fleet with a cloud of destroyers and trawlers. Further submarine development may shake the world's confidence in the ability of

heavily gunned and armored ships to retain command of the sea. If they refuse the risk involved and remain in port while other vessels perform their duty, is not the price more than a nation might be willing to pay?

In the case where two belligerent surface fleets are so equally matched that they are each seeking to engage, the part the submarine will play in the battle will be difficult to accurately determine. This is the condition that was in the minds of the advocates for fleet submarines. The moderate surface speeds of submarines would prevent them from gaining advantageous positions for submerged attack; destroyer speed would be necessary for this. Great difficulty might be encountered in recognizing friend from foe after submerging. Submarines would be in danger of being rammed or shelled by both sides indiscriminately. It is said, even destroyers suffered this disadvantage in recent battles in Europe. One plan might be to use them in a definite area before the action or after action upon the enemy's normal line of retreat. If possible, submarines should be present when the battle takes place.

X. SIZE

Even the rankest doubter is now convinced of the value of an effective submarine. However, we are very widely at variance over the type we should build.

It is most difficult to decide where principles already understood for one type should be applied in the evolution of a dissimilar type. Some years ago there were serious proposals to build two types of destroyer; one of small size for coast defence and one of large size to go with the fleet.

In building any type of warship consider the maximum service the type may be called upon to perform.

Small size, short radius submarines fit into a passive defensive plan of employment; to fight the enemy after he arrives practically in sight of our coast. As our coast line is very long, numbers are an important feature in such a plan. Might not a commander-in-chief decide to employ his submarines in an advanced position? If he did so decide, he would be unable to carry through his plan.

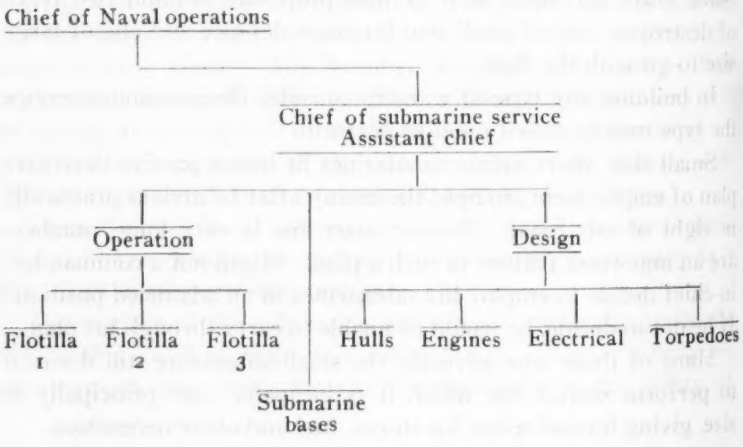
Many of those who advocate the small submarine still desire it to perform service for which it is incapable, due principally to size, giving limited space for stores, fuel and other necessities.

From the standpoint of normal evolution can we place a limit upon displacement? How can it be said, without a glance into the future, that a submarine of a certain tonnage will fulfill our requirements? Submarine growth cannot be regulated in that way.

XI. THE PRINCIPLES OF UNDIVIDED CONTROL

When the submarine appeared in our navy, more or less in the shape of a large torpedo, it is said that a proposal to turn it over to the Bureau of Ordnance was seriously considered. If the torpedo with which we are working to-day had been divided up among the bureaus, would the torpedo be as satisfactory? However that might be, it is evident from past difficulties and present development that no harm to the submarine can come if we place the responsibility upon the shoulders of a single individual and give him the responsibility and the money power to develop the type of submarine capable of performing the duties called for in our naval war plans. We cannot get away from the truth that both the submarine and the aeroplane require individual attention and cannot thrive in close contact with sturdier, well-developed types of warships.

In view of the importance of the submarine to a comparatively weak sea power, counciling prompt and scientific treatment, would not a closer co-ordination of all those who are designing and developing this type be a reasonable solution?



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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

THE WAR WITH SPAIN

A STUDY OF PAST PERFORMANCE

By H. C. WASHBURN

If the United States had lost the war with Spain, the American people would have been aroused for the past 18 years to the prime importance of thoroughgoing military preparedness. Conversely, it was the apparent ease, the quickness, and the completeness of our victory in 1898 which constituted, and still constitutes, by far the most important cause of all opposition to greater measures of preparedness.

Nothing is more demoralizing, and consequently more supremely dangerous, than to win, quickly and decisively, a victory for which no adequate preparation has been made. Yet that is precisely what the United States did in the Spanish-American War.

The American people have never even begun to realize how *lucky* they were to *escape the penalty of unpreparedness* in 1898. To that lucky escape—misunderstood as the natural triumph of a superior people—may be attributed the fact that the United States learned no serious lessons from the conflict with Spain, and that even the greatest war in history has hardly sufficed to awaken the average American citizen to the need of preparedness of a kind and an extent which he can hardly comprehend.

It has been said that we won the Spanish War "in a canter." This pleasant figure of speech is somewhat boastful, to say the least. On second thought—carrying the metaphor to its logical conclusion—the horse that is beaten in a canter must be a very poor horse, or one that is unduly handicapped. In other words, there would seem to be very little credit in winning an easy victory. The ease of the victory must bear some ratio to the

weakness of the enemy defeated. To the judicious mind, there is nothing less triumphant than knocking down a man of straw. To the thoughtless, and to those who are not aware of the straw, the feat gives a fine sense of power.

Nevertheless, the phrase about winning in a canter in 1898 has some basis of truth. In exactly 109 days, Uncle Sam wrested from Spain an empire in two hemispheres. The amazing suddenness of this victory was fortunate not only because it saved the Americans from heavy financial burdens and from the loss of life entailed by a long war, but because it made a strong impression upon Europe. Yet it was most unfortunate in its reaction on American public opinion. "We were unprepared, but we won easily in spite of that." This is what millions of uninformed people believed at the time, and what they believe to this day. It is a half-truth, and like all half-truths, it is dangerously plausible. It implies the further comment that "We can do it again." It implies that our military policy, though considered by "alarmists" to be haphazard and unsound, was vindicated by its most recent test in war. And it is precisely at this point in the workings of American psychology that the half-truth and the complacent boast become demoralizing, and tend to undermine all thorough efforts to attain preparedness.

As a matter of fact, the United States walked into the Spanish War in its sleep. . . . . *Before Americans had time to wake up, Spain had thrown the war away.* This is not in the least an exaggeration. The more one studies the facts, the less of an exaggeration it seems. Had Spain exerted all her skill to lose the war, she could not have attained the actual result more surely.

What was the Hispano-American situation, naval and military, on the day of the declaration of war, April 21, 1898? What were the relative forces opposed, afloat and ashore?

The United States Navy was estimated to be approximately equal in power to the Spanish Navy. Although, on the Spanish navy list there were 137 vessels rated as in commission, as compared with 86 on our list, this comparison of figures was deceptive. The United States had six armored ships of 8000 tons or more, including four first class battleships, the *Iowa*, the *Indiana*, the *Massachusetts*, and the *Oregon*. To be sure, the *Oregon* had to make her way round Cape Horn before she could be counted on. On the other hand, Spain had but one first

class battleship on her list—the *Pelayo*—and was therefore outclassed in heavy ships of the first line, but she possessed a unified squadron of five fast armored cruisers, as compared with our two, the *New York* and the *Brooklyn*. Also, the six slow, unseaworthy monitors which were supposed to constitute a good percentage of American naval strength, were comparatively worthless, and, according to Admiral Mahan, their tonnage could with infinitely more profit have been converted into two battleships. Technical discussion of the relative values of the various types of vessels in the two navies is not necessary. It is sufficient to recall that by the only assumptions American naval officers could make before the supreme test of battle, *the United States had no preponderance in sea power*. "An excellent authority," writes Admiral Mahan, told him that "the loss of the *Maine* had changed the balance; that whereas with the *Maine* our fleet had been slightly superior, so after her destruction the advantage, still nominal, was rather the other way." Later events, however, proved how lucky the United States was to find, at the last moment, that the task for which its navy seemed inadequate—a task far more difficult under the circumstances than the task of an *equal* opposing force—had become an easy task indeed. These later events proved that the Spanish Navy was by no means really equal, or anywhere near equal, to ours; that it had been the victim of gross if not criminal maladministration. It was, to use plain words, in a state of decay. Both in Asiatic and European waters, its *available* force was decidedly inferior, respectively, to Admiral Dewey's squadron and to Admiral Sampson's fleet. It was inferior not only in the number and the kind of ships ready, or apparently ready, for war, but inferior in equipment, in the training of its personnel, and in its controlling tactics and strategy. Spanish naval officers cannot be blamed for this state of affairs to any appreciable extent. It was mainly if not almost entirely the fault of the Spanish Government, which had neglected the navy for years, had failed to provide it with the necessary funds for construction and repair, or with coal and ammunition sufficient to carry out maneuvers and target practice. The Spanish Ministry of Marine had consistently closed its ears to repeated appeals of Spanish naval officers. The letters of Admiral Cervera to the Spanish Navy Department constitute one of the most pathetic chapters

in naval history. *His squadron had never maneuvered together until it steamed from the Cape Verde Islands under war orders.*

If our navy was nominally about equal to the enemy's, our army was vastly outnumbered for the task it had every reason to expect. Our regular army numbered but 28,183 officers and men. This figure, small as it was, was deceptive. It was obtained by the most flattering estimate, which included both line and staff, non-combatants, such as the hospital corps, and even the West Point cadets and their professors. Compared with this apparent figure, 28,183, the total strength of the land forces of Spain under arms at the outbreak of war was 347,817! This is an estimate very carefully made by Captain Herbert H. Sargent, U. S. Army, after exhaustive study. It falls far short of the figures published in the Spanish army register, the "Anuario Militar de Espana," for 1898, which gives the total at 492,067. Again, according to the best authority, the strength of the Spanish Army of Occupation in Cuba alone at the outbreak of war was 196,820 officers and men, of whom 155,000 were regulars. Against this army of 196,000 we were to pit a force of 28,000! What would seem to be the chances of success? What would be thought to-day of a nation that sent an army the size of Shafter's—18,000—to invade an island the size of Cuba defended by over 190,000 troops under arms? Yet this is exactly what the United States did in the Santiago campaign. It was a miracle that our army accomplished anything except its own destruction. What was this miracle? Nothing more nor less, indeed, but incompetence in the persons of General Blanco and General Linares, officers commanding respectively the Spanish Army of Occupation in Cuba, and the army defending Santiago. The very figures alone are conclusive proof that Spain threw away her Cuban campaign by apathy and incapacity on the part of her generals. A great general in Cuba, with 190,000 men, would have destroyed utterly any force of 18,000 sent against him and forced to land from transports on the shores he was defending. Nor was it necessary that a defending force so amazingly superior should be commanded by a great general, but only by a general of ordinary ability, in order to wipe the attacking 18,000 from the face of the earth. There were, it is true, some 15,000 effective Cuban insurgents in the island, but they were almost negligible in anything but scattered

guerilla warfare. General Shafter gave them their one great encouragement and opportunity, only to find that their resistance to the Spanish forces, and their assistance to his own, amounted to practically nothing.

The bulk of the Spanish Army in Cuba was concentrated in and about Havana, but there were scattered detachments throughout the island. Three years of minor operations against the insurgents had accustomed the Spanish generals to the scattered "trocha" or "cordon" system of warfare; they had apparently lost the instinct of all able military leaders—to concentrate against the enemy. Moreover, they seem to have been obsessed with the idea that Cuba and Havana were synonymous terms: that to hold Havana meant to hold Cuba. General Blanco failed to realize that the protection of Cervera's squadron—in whatever port it sought refuge as a base of operations—was more important than the defence of Havana. Havana, moreover, was perhaps the greatest stronghold in the western hemisphere. Its garrison of 60,000 men was a force more than strong enough to hold it against any expeditionary force that the United States could possibly send for months—for a year, more probably. Had Blanco been content to leave 60,000 in Havana, he could have thrown at least 80,000 of the remaining 136,000 troops around any of the few ports at which Cervera sought protection. Time was not lacking. Early in April it was suspected, and early in June it was known, not only to Captain General Blanco, but to all the world, that Shafter's army would go to Santiago. The American newspapers, untrammeled by censorship, announced all the plans of our army and navy. Cervera's squadron entered Santiago on May 19. If there was any uncertainty whether his squadron would remain there, that uncertainty was removed at least by June 1, when Admiral Sampson arrived off Santiago and began the tight blockade for which he has never received due credit. From June 1 to July 1, General Blanco wasted time that was priceless. In those 30 days, if not before, he should have concentrated about Santiago at least 80,000 men. Why he did not must ever remain a mystery. Had he done so, Shafter's 18,000 could not have landed, or, if by some strange mischance, they had landed, they would certainly have been driven into the sea, captured, or destroyed. Any other result,

in view of what actually occurred in the Sanitago campaign, is unthinkable.

The success we met, in these circumstances, was due to the following factors: (1) The inferiority of the Spanish Navy. (2) The fact that Cervera entered Santiago instead of Havana. (3) The lack of railroad connection between Santiago and Havana. (4) The apathy and incapacity of the Spanish generals. (5) The destruction of Cervera's squadron, preceded and followed by the greatest factor of all—our command of the sea. It was but one of many instances of what Admiral Mahan made famous, "The Influence of Sea Power Upon History."

Since control of the sea was the vital issue of the war, the Spanish Government, by inflicting unpreparedness upon its navy, had literally lost the war before it began. In spite of this, the war would have lasted much longer, and Spain's ultimate defeat would have been correspondingly less damaging to her prestige, if her generals in Cuba had known their business. Let us see first of all by what steps we gained control of the sea.

The battle of Manila Bay startled the world. Admiral Dewey, giving the enemy credit for the preparations which he himself would have made had he been in their place, acted with great decision, was thoroughly prepared, and carried out a most daring plan with complete success. His victory will always live in history as a brilliant achievement. There was in it, however, a large element of luck, which the admiral himself would have been the last to deny. This luck consisted, like all our luck in the war, in the unpreparedness and lack of skill of the enemy. When the strong defences of Manila are considered, we have cause to congratulate ourselves on the low state of Spanish marksmanship in the many shore batteries, as well as on Admiral Montojo's ships. We are proud, and we should be proud, of Dewey's daring entrance, at midnight, to a supposedly mined bay, and of his passing within easy range of the big guns on the islands at the entrance, El Fraile, Caballo, and Corregidor. We are proud of his bold indifference to the guns of Manila, and the guns near Cavite, on Sangley Point. Nevertheless, confident as we are that Dewey and his brave men would have won against odds not impossible, we must realize that he found the enemy's ships less than three to five in ratio to his strength, that the Spanish admiral elected to take a fatally unsound defensive

position at anchor, that the dreaded submarine mines were not there or were useless, and that the marksmanship of the Spaniards did not deserve the name—it was universally poor, poor beyond all calculation, beyond all surmise.

The battle of Manila Bay was decisive, so far as the sea-control of the Philippines was concerned, pending the result of a subsequent conflict between the main sea forces of the two nations. The naval battle off Santiago, then, was the decisive sea-encounter of the war.

Spain's naval forces in European waters proved to be largely illusory—fell off from the paper strength sadly at the actual muster. The *Princesa de Asturias* had not received her boilers and engines; the battleship *Pelayo,* and the *Emperador Carlos V,* had not received their main armament; other ships were not ready; even the *Cristobal Colon,* the fastest and potentially the best ship in Cervera's squadron, had not been fitted with her turret guns, nor was she so fitted—but merely with "dummies"—when she went to her doom on July 3. Much necessary equipment and munitions were lacking in Cervera's four ships. In the month of April, shortly before the war, Cervera wrote one of his tragic letters to the Spanish Government: "The conflict is coming fast upon us; and the *Colon* has not received her big guns; the *Carlos V* has not been delivered, and her 10-cm. artillery is not yet mounted; the *Pelayo* is not ready for want of finishing her redoubt, and, I believe, her secondary battery; the *Vittoria* has no ordnance, and of the *Numancia* we had better not speak." He might have added, "of the Spanish Navy we had better not speak." For months before, for years before that, Cervera and other Spanish naval officers had warned their Ministers of Marine—to no avail.

Despite this unpreparedness of Spain's main naval forces, which demanded time for correction, the Spanish Minister of Marine, against the wise and patriotic pleadings of Cervera and all professional opinion, but goaded by popular clamor, committed the fatal folly of *dividing* these forces in half before the whole was ready, and sent Cervera's four cruisers and three destroyers to Cuba. If Americans smile at this error in sending one-half to meet the enemy's whole number, they will do well to recollect that the United States Atlantic Fleet, our main naval strength, *was itself divided* at a most critical moment, half

our forces being detained at Hampton Roads under Schley, and the other half sent to Key West—where all should have been concentrated. This misfortune, which resulted in Cervera's reaching Cuba, was due to political pressure. There was a great panic among the people along the Atlantic coast, a panic caused by realization—alas, too late—of the weakness of our harbor defences. The American people did not foresee, nor did they comprehend at the time of the panic, that inadequate coast defences would have a vicious effect upon the plans of our naval campaign, and upon the carrying out of those plans. To quote a dictum of our greatest authority on sea power, Admiral Mahan, "*a naval force should not be in any way responsible for the safety of the ports it quits.*" Coast defences are intended not only to protect harbors, but to protect naval forces when they are within these harbors. The converse is not true. Naval forces are not intended to protect harbors. In fact, our navy, though loosely called the first line of "defence," is primarily, essentially, an *offensive* force. Its duty is to protect us, but this protection can only be secured by destroying the naval forces of the enemy, or by blockading them in their ports—which amounts to the same end desired, *the control of the sea.*

Harbor defences, then (for there is no such thing, strictly speaking, as "coast defences"), are, or should be, a *complement* to the navy, a very necessary complement, to be sure, but an entirely separate and independent kind of defence. In the war with Spain, this complement was incomplete; instead of protecting our navy, it was a serious handicap to the navy, for the navy was called upon to protect the harbors in which it should have been sure of a refuge. The navy was therefore reduced 50 per cent in available force at the very time when 100 per cent was most needed—when Cervera's squadron was on its way across the Atlantic, heading for Cuba, and when it was of the utmost importance that Cuba should be completely blockaded, to the end that Cervera should be prevented from reaching Cuba, and that his squadron should be destroyed in battle before he could seek the security of some Cuban port. With 50 per cent of our navy at Hampton Roads, the remaining 50 per cent under Sampson was sufficient only to blockade the northern coast of Cuba, Havana being the prime object of this blockade. Had Schley's squadron been released from its central protective

position at Hampton Roads, and sent at the very beginning to the south coast of Cuba, we could have blocked Cervera's entrance to either Cienfuegos or Santiago, and the campaign of Santiago would then have been unnecessary. The sole object of this campaign was to *drive* Cervera's squadron *out*. In other words, if Congress had done its plain duty by our harbor defences, our whole navy would have been released, Cervera would have been destroyed before he reached Cuba, and the sacrifice of the lives of the brave men who fell at Las Guasimas, El Caney, and San Juan would have been avoided, as well as the sacrifice of the hundreds who died of tropical fevers.

To this statement it may be objected that Cervera, meeting our naval force off the south coast of Cuba, could have escaped, and might have reached San Juan, Porto Rico. The answer to this is that we are concerned with probabilities based on the facts which are known. Schley's squadron consisted of the armored cruiser *Brooklyn,* the two battleships *Massachusetts* and *Texas,* and the two cruisers *Columbia* and *Minneapolis.* Had he been on blockade duty, he could have placed the *Brooklyn* and the *Texas* off Cienfuegos, and the *Massachusetts,* the *Columbia* and the *Minneapolis* off Santiago. There was no other port on the south coast to which Cervera could have gone. Either of the two elements of Schley's squadron thus distributed was sufficient in power to prevent Cervera from entering port. With proper scouting, there would have been time enough to unite the two elements before Cervera made his appearance. Had he been chased, and assuming that he would then have been able to outdistance Schley's squadron, the only Spanish port open to him, and adequate for his coaling, was San Juan, Porto Rico. The harbor of San Juan was weakly defended, and its channel, while not ideal for attack, or even entrance—for the ships of those days, however, it was feasible—presented nothing like the problem of the "sabre-cut in the hills" which barred the way to Santiago, and which could have been blocked by the *Merrimac* had she been sunk squarely across it. Of this tortuous, canyon-like entrance, Admiral Sampson said, in his letter to General Shafter dated July 2, "by the sinking of a ship (during an attempt to force the entrance) the object of the attempt to enter the harbor would be defeated by the preventing of further progress on our part." San Juan, how-

ever, had been approached by Sampson near enough to bombard the city. The old *Texas* and the *Massachutetts* found the channel practicable at a later date.

Such were the possibilities we had to forego because our own harbor defences were inadequate. What possible excuse was there for the poor state of these defences? In 1885-1886 the Endicott Board had recommended the installation of 2362 pieces of modern ordnance for our harbor defences. Congress had approved these recommendations, then and later, but Congress had not carried them out. On April 1, 1898, of the 2362 guns "contemplated," only *151* were in position. The emergency defence bill which appropriated $50,000,000 on March 8 came too late to repair the damage done by shortsighted delay covering a period of *13 years*. Moreover, far too little ammunition had been provided by Congress, even for the small number of guns emplaced. "For the 8-inch guns there were only 12 rounds each; for the 10-inch, 20 rounds; for the 12-inch, 15 rounds; and for the mortars, 10 rounds. . . . . Dilatory and grudging legislation had borne its fruit." (Alger, The Spanish-American War, page 11.) It is interesting to compare our total coast defence ordnance in 1898 with the guns which then defended Havana: 111 pieces of rifled ordnance frowned from this one port alone. They ranged from 12-inch to 6-inch for the majority of pieces, though they included guns of 4.7 and 3.5 caliber. In addition, there were 46 heavy howitzers, 10 mortars, and 9 rapid-fire guns. Not only did over 100 high-power guns menace an attacking fleet, but the elaborate system of intrenchments, manned by the bulk of the garrison of 60,000, was defended by heavy trench guns and mortars, and by 134 pieces of field artillery. In our whole army there were but 40 pieces of field artillery of this kind; of these 40 pieces, but 16 were used at Santiago, and the black powder exclusively provided for them offered such a target of white smoke that the guns were almost useless. On several occasions they had to be withdrawn from their positions, and on the whole they were not so effective as the Gatling guns—of which we had at Santiago four in all. This fiasco was not the fault of our artillery officers, who had begged again and again for smokeless powder. Nor is it the fault of our army officers that the United States has, even now, so small an equipment of field artillery. Before the European War began, France had

no less than 3000 of the famous "75" guns. At this writing, June, 1916, the warning of the world war has gone so far unheeded that the United States Army has but 123 guns of the "75" quality and type. We have learned little since the war with Spain. If we are to learn anything by a serious study of that war, we should remember the painful contrast between the 40 field guns we had in 1898, and the 134 field guns that defended Havana. These figures alone should give us pause. It was fortunate that we did not have to face the task of taking Havana!

Aside from the handicap imposed upon our navy by weak harbor defences, our navy was itself inadequate in numbers to do the work required before battle was joined, the preliminary work that is so necessary to prepare for the ultimate destruction or blockade of an enemy's forces. Here again, the weakness of the Spanish Navy saved the day. We should have had more battleships, more armored cruisers of high speed, and more swift scouts, auxiliaries, colliers. Had we possessed even a few more of these several types, the United States Navy could have accomplished the following: 1. The maintenance of a complete blockade of Cuba—not only to prevent access to any Cuban port by the enemy, but to establish a commercial blockade "effective" under international law. Remember that the first object was not attained, as it could have been with another squadron at our disposal, and that the second object, even at a sacrifice of other objects, was not attained except in the barest and most nearly disastrous way. Had our blockade been a little bit looser than it was, neutral nations would have made just complaint; as it was, there was considerable uneasiness at home and abroad. 2. The protection of 3000 miles of coastwise trade on the Atlantic side alone. Howell's squadron was assigned to this duty—a squadron so small that it was manifestly unable to succeed if there had been any serious trouble. 3. The absolutely safe convoy of Shafter's army corps to Cuba. With all the convoy we could spare, we had far less than enough. A false report of the presence of two Spanish armored cruisers in the Caribbean was enough to delay Shafter almost a week, when delay might have been more costly. As it was, Shafter fought the battle of San Juan only two days before Escario arrived with reinforcements of 3600. 4. Scouting operations sufficient in scope to prevent Cervera from reaching Cuba without resistance

from our battle fleet. On this no comment is needed. 5. The duty of risking certain ships in an attempt to force the entrance to Santiago harbor, in cooperation with General Shafter's army campaign. Since we had but a minimum of naval strength, let alone a reserve to draw upon, we were forced to husband every single ship we had, even after Cervera's squadron was destroyed; owing to the danger of foreign intervention we could not afford to risk even one ship in the much-needed attempt to force Santiago from the sea. This inability was the cause of the well-known controversy between General Shafter and Admiral Sampson. 6. The necessity of attacking or blockading two objectives at once—Cuba and Porto Rico. Porto Rico is to Cuba what Malta is to Egypt, as a base of naval operations. By entering Santiago, and by having a weak force, Cervera relieved us of this problem. In the future, we shall have to maintain Porto Rico as a base if we are called upon to protect Cuba.

In entering Santiago, Cervera did us the biggest favor he could have done. It was fortunate for us that he did not enter Cienfuegos—a place which, as he naturally supposed, we would blockade more carefully than Santiago. As a matter of fact, Cervera could have reached Cienfuegos without any trouble. Had he started from Curacao precisely when he did, with the same speed he actually used, but with his course set for Cienfuegos, he would have arrived there with absolutely no American man-of-war to intercept him. His ignorance of our weakness was our good fortune. Cienfuegos, second only to Havana as a strategic point, was connected with Havana by railroad. Not far from the capital, it was in the region where the bulk of the Spanish Army was concentrated. That Blanco could not have thrown, with ease, at least 80,000 men into Cienfuegos and its vicinity, is inconceivable. Against 80,000, what could Shafter have done with his 18,000?

Compared with Cienfuegos, Santiago was remote from Havana. The distance from Havana to Cienfuegos is 130 miles. The distance from Havana to Santiago is 475 miles. This disparity in distances was in 1898 greater than the figures indicate, from a military point of view, since Cienfuegos could be reached from Havana by rail, while Santiago could not. Railroad connections eastward from Havana went no farther than Placetas, in the center of Santa Clara province. From Placetas to San-

tiago the distance was 300 miles, as the crow flies, and, of course, more than this along the roads and trails. Consequently, it was far more difficult for Blanco to reinforce Santiago than it would have been to reinforce Cienfuegos. This circumstance was fortunate for the Americans.

But was it impossible for Blanco to send reinforcements over that distance from Havana? It was by no means impossible. Escario's march from Manzanillo proves this. Starting from Manzanillo on June 22, Escario broke through the most important force of Cubans in the island, Garcia's 5000, and reached Santiago on July 3, with all but a few men of the force he commanded—3660. Over ground as difficult as any in the island, he had marched in spite of Cuban resistance 100 miles in 11 days. If Escario could do this with less than 4000 men, it would seem that other Spanish commanders should have been able to accomplish as much with larger forces. In the provinces of Santa Clara and Puerto Principe there were some 40,000 Spanish troops. The average distance between their posts and Santiago was from 200 to 250 miles. Surely a considerable number of these could have reached Santiago by June 30, if they could equal Escario's effort. They would have had to start sooner than Escario did, but Escario had started very late. The reinforcement of Santiago should have been organized and troop movements begun as soon as Cervera was blockaded in Santiago. Cervera reached Santiago on May 19. By June 1 the blockade was complete. Had Blanco been an able general he would have issued orders to concentrate all the troops in Santiago province, and perhaps certain troops from Puerto Principe, the adjoining province, at the point where they could protect Cervera; the city of Santiago, situated in a central position in its province, was a point of concentration, in any event, aside from any consideration of Cervera. The only possible reason for not reinforcing Santiago was a faint hope that he might escape from there and make his way to Cienfuegos, but there were enough soldiers in the island to secure both these points, in addition to Havana. As between Cienfuegos and Santiago, Blanco should have had no hesitation in choosing the latter for concentration, the moment Cervera arrived. Time was not only precious, but priceless. More squadrons were expected from Spain, but until they could arrive and break the blockade, thus joining Cervera's

squadron, it was Blanco's duty to assure the safety of the first squadron by every means in his power.

"Early in *April* Captain General Ramon Blanco informed General Linares (commanding at Santiago) that the Americans intended to land an army at some point on the eastern coast of Cuba for the purpose of making an attack on the city of Santiago, and recommended the construction of batteries at both Santiago and Guantanamo to repel attacks by sea and to check any bands of insurgents that might operate in conjunction with Americans. . . . . A few days later he informed Linares that Marina's brigade and sufficient provisions to last the Spanish troops at Santiago for four months would be sent him. After some correspondence between Blanco and Linares in regard to the advisability of concentrating the garrisons of Sagua de Tanamo, Baracoa, and Guantanamo at Santiago, it was decided to remove only a part of the troops occupying these places. . . . . On April 20, the very day that the Spanish Minister in Washington demanded his passports, Blanco informed Linares that Marina's brigade would not go to Santiago. Prior to the blockade of the port no further efforts were made to reenforce the garrison at Santiago, except to move a few troops from the inland towns near the city to positions immediately surrounding the harbor; but early in June, when the blockade had been completely established and when it became evident that the Americans would make a land attack against Santiago, it was announced from Havana that two or three battalions were to be ordered from Holguin to Santiago. This, however, was not done. About this time, too, General Linares considered the matter of bringing a battalion of infantry, a section of mountain artillery, and half a company of engineers from Guantanamo to Santiago, but for some reason the order for this movement was never issued." (Sargent.) Thus did Blanco and Linares throw away their chances, by indecision, by failure to grasp the principle of concentration, the first rule of war. Worse still, to quote Sargent again: "At the outbreak of war not only was the city of Santiago inadequately supplied with provisions, but the troops in that vicinity had only sufficient rations to last a few days. . . . . The army at Santiago had not been paid for several months. The steamer *Mortera*, on April 25, brought into the city a supply of provisions. . . . . This was the only

effort made by General Blanco to send supplies to Santiago, although there were in the harbor the Spanish merchant vessels *Mejico, Mortera, San Juan, Reina de los Angeles,* and *Tomas Brooks,* which from the declaration of war on April 21, to May 18, when the first hostile ships appeared off Santiago, could have gone to neighboring islands and returned with impunity. . . . . The provisions on hand, with the exception of rice, were scarcely sufficient to last the troops a month."

If, from "early in April" to May 18, Blanco missed the opportunity to send troops by sea to Santiago, he still had from May 19 to June 30 to send them by land. Orders should have gone simultaneously to the troops in Santa Clara and Puerto Principe, and to the scattered garrisons in the province of Santiago. If Escario could make 100 miles in 11 days, the 40,000 troops in Santa Clara and Puerto Principe, the most distant of which were 300 miles away, could have reached Santiago in something like 33 days. They had 43 days, from May 19 to June 30, in which to make the march, and therefore 10 days to spare. Moreover, at least 15,000 of them were from 230 to 200 miles from Santiago; certainly these had plenty of time. Yet, supposing for the moment that concentration was practicable only in the province of Santiago, we shall see that even this was not done. At Holguin, 70 miles from Santiago, there were 8364 men; at Guantanamo, 40 miles away, 5992; at Baracoa, 90 miles distant, 742; at Sagua de Tanamo, 60 miles distant, 720; and in nearby towns, from 12 to 2 miles distant, 2666. At Santiago itself, however, there were but 9430. Whereas Linares had at his certain disposal 36,582 officers and men, to which the addition of 1000 sailors from Cervera's squadron made 37,582, he made use, and very poor use at that, of only 13,096 on June 30. What a tragic waste of opportunity! In the island of Cuba, 196,000 troops; in the province of Santiago, 37,582; actually in Santiago and its vicinity, only 13,096. What luck for the United States! Perhaps Shafter's 18,000 would not be fatally outnumbered after all.

Outnumbered? Who would have dreamed that at El Caney our troops were to outnumber the Spaniards 12 to 1? Who would have dreamed that at San Juan our troops were to outnumber the Spaniards almost 8 to 1? Yet this is precisely what happened. At El Caney, Lawton had a force of 6653. At San

Juan, Kent and Sumner had a force of 8412. Lawton faced 520 Spaniards. Kent and Sumner faced 1197 actually engaged Spanish troops. In other words, the Americans fought these two decisive battles with a total force of 15,065 against 1717 of the enemy, or less than 1 per cent of the Spanish Army of occupation. That this should have happened was nothing short of marvelous.

Linares lost three separate and distinct opportunities to outnumber, if not to defeat, Shafter's forces: 1. When the disembarkation began at Daiquiri. 2. At Las Guasimas. 3. At El Caney and San Juan. Concerning all three of these actions, Sargent writes as follows: "Victory was clearly within the grasp of the Spaniards had their generals shown even mediocre ability. It required no Napoleon, no Wellington, no Grant, no Lee, to see this. Every *soldier* saw it then; every soldier sees it now. And the pity of it all is, that such brave men as the Spanish soldiers showed themselves to be, should have been required to sacrifice their lives under such incompetent leadership. Battles cannot be won without the concentration of forces; it is the A B C of a soldier's education. If a general has not the wisdom to concentrate his forces when the opportunity offers; if he has not the wisdom to make even an effort to outnumber his enemy on the battlefield, he might as well acknowledge himself beaten at the start." Sargent agrees with all other authorities that "the hills and ridges about Daiquiri are so well suited for defence that in a few hours they could be made almost impregnable against any frontal attack. Take, for instance, the long ridge lying three or four hundred yards back of Siboney. This ridge is perfectly adapted for a strong defensive position against an attack from the sea. It is, in fact, a natural fortification, its crest a natural parapet. It commands the landing completely, and the sea also to a considerable extent, and has an open field for fire in its front. It is believed that a battery of field guns and even four or five hundred Spanish soldiers posted on this ridge, displaying the well-known courage of their nation —that splendid courage which they subsequently displayed at El Caney and San Juan Hill—could have prevented the landing of General Shafter's army at Siboney, even though it had been supported by all the warships of the United States Navy. And so, likewise, at Daiquiri, though here perhaps a thousand men

would have been required to hold in check the Cubans and at the same time prevent the disembarkation of the American Army. But there were other strong reasons why the Spaniards should have made an effort to prevent the disembarkation of General Shafter's army. In the first place, because the most critical time during the whole campaign through which the American Army passed was during its disembarkation. At that moment its hands were tied, and consequently it possessed little or no striking power. Until the troops were landed they were practically harmless, and for a considerable time before the landing they would have been under the fire of the Spanish troops. In the second place, because a sufficient Spanish force was available for occupying the strong natural positions in front of Siboney and Daiquiri. In fact, with the exercise of ordinary skill and energy, the greater part of the 12,096 Spanish troops at and about Santiago and the harbor, and on or near the railroads leading thither, could have been concentrated, probably within 24 hours, certainly within 48, upon any landing point in the vicinity of Santiago.

"Such being the case, it is obvious that at the very beginning the Spanish commander was offered a splendid opportunity, by a concentration of troops at the landing, of preventing entirely the disembarkation of General Shafter's army, and later, when the disembarkation was partly completed, of concentrating an overwhelming Spanish force against a fractional part of the American Army.

"To this plan of operations one might reply that the Spanish commander did not know in advance where the American Army would land; and that as the American Navy was shelling a number of places on both sides of the Morro, there was nothing to indicate which place General Shafter would select for a landing. The answer is that the strongest kind of strategical reasons pointed to the fact that the landing would be attempted in the vicinity of Siboney and Daiquiri, and that there might easily have been assembled from the Spanish forces in the vicinity of Santiago twelve or fifteen hundred men opposite Siboney and Daiquiri, and three or four hundred opposite each of the other landing places near the Morro, and that these troops would have probably been able, unaided, to prevent the landing. Certainly they would have been able, under the most favorable circum-

stances, to cause sufficient delay to give the remaining Spanish troops the opportunity of concentrating at the landing points. . . . . The Cuban insurgents did no hard fighting at this time or afterwards." It is to be noted in connection with the foregoing comment that the disembarkation of the American Army began at 10 minutes to 10 o'clock—the moment at which the small boats previously loaded with troops were towed shoreward—and that by the evening of the first day, only 6000 American troops had been landed. "No attempt was made by the Spaniards to oppose the disembarkation. General Castillo's Cuban troops were found at Daiquiri; but they had failed to intercept or capture the two or three hundred Spanish soldiers that had been occupying the place. In fact, *early in the morning before the disembarkation began* these Spanish troops *withdrew* from the town and *retired* to Firmeza without opposition." Henry G. Sharpe, in his "The Provisioning of a Modern Army in the Field," quotes the opinion of German authorities, and in particular of Rear Admiral Pluddermann, "that as the rocks reached close to the sea, and afforded many places screened from the fire of the warships, 300 determined men, although they might not have been able to frustrate the landing entirely, could certainly have inflicted very severe loss on the invaders." Colonel Roosevelt is one of a number of others who realized what luck we had at Daiquiri, owing to Spanish incompetence. He remarks, on pages 74 and 75 of his book, "The Rough Riders," "The country would have offered very great difficulties to an attacking force had there been resistance. It was little but a mass of rugged and precipitous hills, covered for the most part by dense jungle. Five hundred resolute men could have prevented the disembarkation at very little cost to themselves." This agrees substantially with the opinion of officers of our regular army and with foreign comment. So much for Daiquiri. The first great opportunity of the Spaniards had been lost; they had given us our first and perhaps most crucial success by default.

The second opportunity they also threw away, at Las Guasimas. Instead of concentrating all the troops he could muster at Las Guasimas, Linares placed there a paltry force, and ordered it to fight a rear-guard action. The battle was an American victory, yet the American troops, 964 officers and men,

were merely an advanced guard, so small that no one expected them to decide an important engagement. General Rubin's forces, of which 1500 men took part in the fight, numbered in all about 2078 officers and men, entrenched in three lines. "The records show that Linares had no intention of making a determined stand. In fact, on the previous day he had given the order to withdraw and to fall back on the strongly entrenched positions immediately surrounding Santiago. It is clear now that if General Wheeler had not pushed forward so hurriedly from Siboney, no engagement would have taken place at Las Guasimas. It is also clear that if General Linares had attempted to hold that position, and had brought upon the battlefield the 2078 officers and men in that immediate vicinity," let alone all his available forces, "and had his soldiers fought with the same determination and courage that they afterwards displayed at El Caney and San Juan, it would have required the united efforts of the entire American Army to dislodge them." (Sargent.)

"There were several excellent reasons why Linares should have fought the decisive battle of the war at Las Guasimas. The position was naturally very strong. The range of hills here is almost at right angles to the main road leading from Siboney to Santiago; and it rises about 250 feet above the valley along which the road passes in reaching this point. The country between these hills and Siboney, and also to the right of the position, between La Redonda and the railroad, is so rugged and covered with such a thick growth of trees, brush, and trailing vines, that it would have been very difficult for the Americans to attack entrenched lines upon the crests of the hills. Had this position been occupied by an adequate force and a determined stand made, the American Army, while waiting for the necessary supplies and transportation to be unloaded preparatory to making an attack, would have been compelled to take up a cramped defensive position around Siboney, where there would have been much difficulty in supplying the command with water. Second, the position was strategically very strong. Had the Spanish forces been massed there, Shafter could not possibly have advanced upon Santiago until he had driven them from the position. It would not have been possible for him to reach Santiago by marching north against the left flank of the Spaniards, for such a movement would have completely uncovered

his base of operations. In that case, Linares, by pressing forward and seizing Siboney and Daiquiri, could have sealed the fate of Shafter's army. Nor would it have been possible for Shafter to reach Santiago by moving westward and then northward along the railroad, for this movement would also have completely uncovered his base of operations at Siboney. When two armies are in such a position on a theater of operations that the movements of both or of either expose the communications of the other, that army whose communications are first exposed will invariably turn back to fight for its communications rather than press on. Had this principle of strategy been known to Linares, it might have been of inestimable advantage to him; for while occupying this position, he could have cast aside all anxiety as to his communications and concentrated on the battlefield all the available troops at Santiago, knowing that the Americans could not possibly reach the city by operating along the railroad without first defeating him. That this principle was not known to him is very evident from the fact that the reason he gave for withdrawing his forces from Las Guasimas was, that he feared the Americans would push forward along the railroad and cut his communications with Santiago.

"The fact is, that so long as the Spanish Army was occupying a defensive position at Las Guasimas and the American Army was covering its base of operations at Siboney, the only possible way that the latter could defeat the former and reach Santiago was to make a frontal attack." (Sargent, "The Campaign of Santiago de Cuba," vol. II, pages 71-74.)

The difference between the weak Spanish resistance at Las Guasimas, where 964 Americans drove back 1500 Spaniards, and the desperate Spanish resistance as El Caney, where 520 Spaniards held off 6653 Americans for over nine hours, is completely accounted for by the orders given to Rubin at Las Guasimas—orders to fight a rear-guard action; and the orders to Vara del Rey at El Caney—to hold that place at all costs. In each case, Linares' subordinates carried out their orders strictly.

We have seen thus far how fortunate for the American Army was the incapacity of the general who defended Santiago—how he practically gave Shafter the first two decisions "by default."

It now remains to consider the third Spanish opportunity that

was wasted—the decision gained by Shafter in the fighting on the first of July, or the double battle of El Caney and San Juan. If in these battles the American Army had been pitted against equal numbers of the Spanish Army, or if the same proportion of both armies had been engaged, there would be no reason for saying that Linares threw away his third chance to defeat the Americans. But we shall see that Linares once more failed to use even the forces he commanded in his immediate vicinity. Throughout the discussion of these battles, it should be noted, first, that the Americans met with heavy losses; second, that they were obliged to make a frontal attack against entrenchments on high ground; third, that the tested theory of warfare with modern high-power rifles makes *one* man on the *defensive* equal to *six* men on the *offensive* under the conditions that obtained, exclusive of the effect of field artillery; fourth, that the American field artillery, owing to its weakness in numbers and to the use of black powder, was of very little use. It is also to be noted that at no time during these battles did the Spaniards use one man on the defensive to six of our men on the offensive. The ratio, on the contrary, varied from one-to-twelve to one-to-eight. Yet Linares had it within his power to make the ratio far different —disastrously different. The more one studies these battles, the more fortunate does the case appear for the United States.

"Out of a total force of 18,218 men, equipped and present for duty, General Shafter concentrated at El Caney and San Juan, on July 1, 15,065 men, while General Linares, out of a total force of 13,096 soldiers and sailors, at and in the vicinity of Santiago, brought on these battlefields only about 1700 men. General Shafter concentrated on the vital points 86 per cent of his army. He brought there practically every available man that could be spared from other important points in the theater of operations, leaving but two or three thousand men to protect his line of communications, to guard his base of operations and to make the attack at Aguadores. Linares concentrated on these two battlefields barely 13 per cent of the 13,096 soldiers and sailors which were at and in the vicinity of Santiago, and less than 6 per cent of the 29,218 troops which were under his immediate command in the district. In other words, he fought the battles of July 1, with less than 5 per cent of the 36,582 Spanish soldiers in Santiago province, and with less than 1 per

cent of the 196,820 Spanish soldiers in the island. These figures tell the tale of the American victories; and the marvel of it is, that although Linares occupied strong positions, intrenched, which increased enormously the fighting power of his troops, he failed to bring sufficient forces on the battlefields to hold the enemy in check. There was nothing whatsoever in the circumstances that could even partly justify such a lack of foresight and generalship. Early in June it was well known, not only to Linares but to all the world, that the Fifth Corps would in a few days leave Tampa for Santiago. Between June 14, when the expedition finally sailed, and July 1, or even between June 20, when the expedition arrived off the mouth of the harbor, and July 1, there was an abundance of time for Linares to concentrate at Santiago a large proportion of troops in the province; but having failed to do this, he could still have brought eight or nine thousand troops on the battlefields of El Caney and San Juan. Nearly all the troops in the cultivated region, the nine companies of soldiers and two of sailors in the vicinity of Punta Cabrera, Mazamorra, and Monte Real, the six companies between Aguadores and the heights of San Juan, the 11 companies along the shores of the bay and in the mountain passes surrounding Santiago, and the company of engineers and company of sailors at Las Cruces, could have been concentrated at Santiago without endangering a single interest; and from there these troops and those which were already in and around the city could in an hour have been massed on any battlefield in the immediate vicinity." (Sargent.)

Assuming that Linares' troops were disposed exactly as they were on the evening of June 30, and that he had given the proper orders for concentration on the morning of July 1, "instead of having 521 soldiers on San Juan Hill and Kettle Hill, as he actually had when the battle opened, he would have had 2504, and by noon about 3812 more," or in all at San Juan, 6316. Judging from what actually happened, "against these 6316 troops intrenched on San Juan Heights and Kettle Hill, the Americans could not possibly have made any headway. The divisions of Kent and Sumner would hardly have been able to reach the crossings of the Aguadores and San Juan rivers: but even if they had, they would have been swept out of existence before they could possibly have got into position to do any

fighting. Even in the battle as it was fought, the greater part of the American casualties occurred before the deployments were completed.

"In the meantime, what would have been the result at El Caney? With Kent's and Sumner's divisions repulsed at San Juan and a large number of wounded to be cared for, Shafter would have been obliged to stop the attack at El Caney and recall Lawton's division to El Pozo, for it would have been extremely hazardous to allow Lawton to continue sacrificing men against a mere outpost of the enemy, while the main Spanish Army, as yet practically unharmed, was in Shafter's front. The outcome of the battle would have compelled Shafter to take up a defensive position, at least temporarily, in the vicinity of El Pozo. Then, after waiting two or three days to care for his wounded and to open up paths and roads through the woods and brush for a better deployment of his troops, he would most probably have made another effort to drive the Spaniards from their positions; but, as Escario's column would in the meantime have arrived, this second effort would probably have failed also. This would have compelled Shafter to resume his defensive position at El Pozo and to await reenforcements. With the American and the Spanish armies facing each other in these defensive positions, either would have been strong enough to repel the attack of the other, but neither would have been strong enough to take the offensive. At this stage of the campaign the outcome would have depended in great measure upon the scarcity of provisions, the progress of the fevers, and the rapidity with which each side could have obtained reenforcements. It may be remarked that had Generals Blanco and Linares been as energetic and resourceful as they should have been, they could have sent reenforcements to Santiago, at least for months, as rapidly as Shafter could have obtained them from the United States by transports. But Linares put his faith in intrenchments and in the courage of his soldiers; he failed to realize that against odds sufficiently great the strongest positions and the bravest troops must succumb. Thus his intrenchments, which should have added to his strength, became in reality a source of weakness."

If the comments thus made on the battles by Sargent are cast aside as conjecture and surmise, though they are conceded by military experts the world over to be criticism of the highest

order, subsequent events go far to corroborate all that Sargent says and more.

On the following day, Linares finally did concentrate his troops against Shafter's forces, which were then, as General Shafter informed the War Department, "in a precarious position." In fact, Shafter told the Secretary of War in his dispatch of July 3 that he was "seriously considering" a withdrawal of the whole army to a stronger position "five miles" in the rear. This dispatch reads as follows, concerning the intention to withdraw: "Upon approaching it (the city) we find it of such a character, and the defences so strong, it will be impossible to carry it by storm with my present force, and I am seriously considering withdrawing about five miles, and taking up a new position. . . ." Shafter explained in this dispatch that he was holding his positions "with a very thin line." If he "seriously considered" the danger of holding with his entire force the heights of San Juan, in the face of the concentrated enemy, does anyone suppose he could have taken them by a frontal assault against the concentrated enemy? Those who believe that he could should examine the losses of the actual fighting that occurred—losses inflicted by 1717 Spanish troops against over 15,000 in the attacking force on July 1. This loss was 223 killed and 1374 wounded, a total casualty list of 1597. If this loss was inflicted by less than 1800 of the enemy, what loss would have been inflicted by the 6316 Spanish troops which might just as well have been engaged? No estimate is possible, but it is interesting to note the opinion of experts that an American victory under those circumstances would have been impossible, and a sustained attack nothing but slaughter. When we remember that 6316 is a small figure indeed compared with the reenforcements which good generalship would have brought to Santiago before July 1—that in the province of Santiago alone there were 36,000 troops, and that these could have been increased by from 20,000 to 40,000; and when we then reflect that General Shafter was sent into this potential inferno with 18,000 men, the *folly* of the American campaign, no less than a quick success which crowned it, staggers the imagination.

On July 3, at 9.30 a. m., Admiral Cervera ended the war by leaving Santiago and going to utter destruction against a greatly superior naval force under Admiral Sampson. Cervera had

said, "The war is the squadron." And it was. The rest was merely a show of resistance by Linares for the sake of Spanish honor. *Hopelessly blockaded,* the Spanish Army in Cuba, though it numbered more than all the volunteer force we had raised in the United States, could not fire another shot to any ultimate purpose.

How easily the United States had won the war! How little the United States deserved to win the war! Our coast artillery, with only 151 guns of all kinds, short of ammunition, short of men to man the forts—but we did not pay the penalty. Our army, only 26,000 strong; not enough transports to take more than 18,000 to Cuba; only 179 medical officers; only 40 field guns; black powder for our artillery; black powder for our volunteers; three ambulances for 18,000 men at Santiago; 14 men who died of disease to 1 man who died in battle. Our navy, inadequate for the task it faced; but by virtue of decay in the naval forces of the enemy, made equal to the task. How we "skinned through!"

It is indeed demoralizing when a nation, unprepared for war, wins that war with ease. Such undeserved victory saps the very foundations of true preparedness. The war with Spain is the theme of our orators, who "point with pride" to the brave deeds of our citizen soldiery, yet fail to understand how brave these citizen soldiers really were. If it is brave to go into battle thoroughly trained, thoroughly equipped, what shall we say of the volunteers who went to Cuba untrained, and equipped with obsolete weapons, weapons more dangerous to themselves than to the enemy? The Second Massachusetts, at El Caney, was withdrawn from the firing line; it had fought with the utmost gallantry, but the white smoke from its rifles could no longer be allowed to make a target for the enemy. It is brave enough to go into a tropical country with enough medical officers, hospital attendants, stretchers, and ambulances "to go around." But what if there be only three ambulances for an entire army corps? What if scenes occur such as Stephen Bonsal describes? "I shall never forget the sight which I shall now attempt, not to describe, but simply to outline; it is the most lasting and indelible of my impressions of the war. And yet it is so fantastic and so horrible that at times I have tried to dismiss it altogether from my mind as an unreal and gruesome dream which came

to me in an access of fever. . . .the first wagon of the noisy, creaking train came out of the forest trail toward us, and pitched down the precipitous bank into the stream. There came out from the wagon, as it drew near, a strange, low, moaning sound. It seemed too regular, altogether too mechanical, to come from human beings in distress. . . . .Having no way of retaining their positions through all the jolting and jarring of the rough army wagon, the sliding backward and forward, the wounded, whom, but half an hour before I had seen, each in his place, now lay all huddled together in indescribable confusion. There they lay, a squirming, writhing mass of naked, blood-stained, and bandaged limbs. . . . .It was hard indeed to realize, as I heard their pitiful cries, that these were the same brave, patient fellows who had smiled so cheerfully as we helped them into the wagon half an hour before, with the thought that at least for the present their sufferings were at an end. You would have been moved with indignation had the bodies that were heaped together in this way been the bodies of the dead. But when you heard the low moans, and caught glimpses of the pale, distracted faces, and the arms and hands stretched from out the writhing mass of men fruitlessly struggling to extricate themselves from their horrible positions. . . . .Not a few were taken out of the wagon dead." These men, and hundreds of others on the night of July 1, did not happen to be placed in one of the *three* ambulances.

What of the men, untrained in camp sanitation, who died in the many camps in the United States? Whereas, during the war, 289 volunteers were killed in battle or died of wounds, no less than 3848 died of disease. The great majority of those who died from disease succumbed to typhoid fever in camps on American soil.

Did we "win the war with Spain in a canter?" Or did we win because, as Bismarck said, "God takes care of drunken men, fools, and—the United States."

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

THE VALUE OF VOICE PIPES FOR FIRE CONTROL COMMUNICATION

By Naval Constructor Elliot Snow, U. S. Navy

Motto: "If at first you don't succeed, try, try again."

More then seven years have now elapsed since the publication of the results of the voice tube experiments which were made at the navy yard, Boston, in 1908 and 1909.[1] During these years some additional fittings have been adopted in the U. S. Naval Service, but the sizes of the tubes and the method of installation remain practically unchanged. As a result of these experiments the acoustical features of our voice tubes were greatly improved, but they are still very far from being satisfactory. There are still instances in the service of old errors being repeated and of adverse criticism being passed on some features of present installations which are in reality not at fault. These criticisms are sometimes based upon a lack of knowledge of the principles involved in the transmission of speech by voice tubes. At other times, however, the criticisms are legitimate and bring to light grave faults in design or poor workmanship. This fact and the further and vastly more important one, that our fleet is destined in the next seven years to be practically doubled in size, makes it now important that the whole question of fire control by voice pipes should be reviewed and brought up to date.

The experiments made at the Boston Navy Yard established the fact that elbows are an almost negligible source of inefficiency and that branches taken off at right angles are not objectionable from an acoustical point of view.[1a] It was also shown and recorded that voice tubing does not "pick up" sound when

[1] "Voice Pipes," by Naval Constructor Elliot Snow, U. S. N., U. S. Naval Institute Proceedings, Vol. 35, Whole No. 131, pp. 769-888.

[1a] The effect of elbows is again to be investigated, experiments along this line having been authorized since this article was compiled.

passing through a compartment containing noisy running machinery. In brief, long sweeps and the lagging of pipes are not necessary for acoustical reasons. Notwithstanding this, requests are still made to eliminate elbows from leads,[2] and even at this writing experiments at sound insulation are again under way on one of our destroyers.[3]

Elbows, Right Angle Outlets and Insulation.—Short elbows and right angle outlets may be used and the insulation of a tube is not required for the following reasons: The sound wave is not a translation of air through the tube, but is simply a transmission of pressure; *i. e.*, alternate condensation and rarefication of the air with a relatively small movement of the molecules of the air. Also the wave length of the male voice in ordinary conversational speech is from 8 to 12 feet, whereas metallic sound waves, such as are transmitted through the vessel's structure in contact with the tube, are so much shorter than the speech sound wave that they are little more than ripples on a large wave surface, and they are of an entirely different timbre.

Factors of Efficiency and Causes of Inefficiency.—Efficient transmission of speech by voice tubes is dependent almost entirely upon the following factors:

(a) Clear and distinct enunciation by the transmitter in a natural tone of voice.

(b) Normal hearing upon the part of the person who receives the message.

(c) Suitable size of tubing for the length of transmission involved.

(d) The material from which the tubing is made should not yield or "pant" under the sound wave impulses.

(e) Efficient mouthpieces for transmitting and receiving.

Inefficient transmission can usually be traced to one of the following causes, assuming that indistinct speech and abnormally hard hearing are not involved:

(f) Incorrect design of tubes.

(g) Faulty installation of tubes.

(h) Speech muffled by placing the lips *and particularly the*

[2] U. S. S. *Minnesota*, August, 1916; U. S. S. *Kansas*, October, 1915.

[3] Bu. C & R letter No. 26-2, January 6, 1916—Test of insulation on voice tubes of the U. S. S. *McCall*. Preliminary report by the Ind. Mgr., navy yard, New York, No. I-2-270, May 3, 1916.

chin in close contact with the mouthpiece, or *by speaking with the mouth removed too far from the mouthpiece.*

(i) Holding the ear too far away from the receiving terminal. A very small difference in position makes a very marked difference in the intensity of the sound wave received.

(j) Local noises near the *receiving end;* noises near the transmitting end have very little adverse effect.

(k) Air currents in the tube.

(l) Dirt, water, or other foreign material clog the tube.

(m) *Variations in pressure due to fitting branches in pipes without making a corresponding reduction in area beyond the branch.*

It is not surprising that the personnel of the service is so little acquainted with the acoustical principles involved in the transmission of speech by voice tubes as there is very little literature extant on the subject; text-books on physics give but the barest reference to the subject. Also other matters heretofore more important have insistently claimed the attention of the service. As these principles are few and are very easily grasped, and since the efficiency of our voice tube systems is of such vital importance to the fire control of our naval vessels, it is believed that each graduating class at the Naval Academy should be given at least one complete lecture on the subject of applied acoustics.

In connection with the following principles it must ever be borne in mind that we are dealing *with a form of energy,* subject to well-known laws as immutable as are the laws governing other forms of energy, such as light, heat and electricity.

Sound when produced *in a confined space,* such as a tube, will continue until the energy is either transmitted to and by the boundary walls of the tube or *is transformed into some other kind of energy,* generally heat.

It is therefore necessary that the walls of the tube be thick enough to prevent the tube from being set in vibration by the voice.

A very highly polished inner surface of the tube, buffed to a glare, is desirable to prevent loss of the smaller waves represented by the hissing consonants, such as "S."

Principles Involved in the Transmission of Speech.—Before proceeding to inquire as to whether or not suitable material and

size of tubing is used in our voice tube systems, and whether or not the mouthpieces for transmitting and receiving are efficient, it is advisable to recall the principles involved in the transmission of speech.[4]

1. Sound waves in air are simply alternate condensations and rarefactions of the transmitting medium. There is no translation of the air itself, the movement is limited to movement between the molecules themselves. In other words, the phenomenon is not at all comparable to that taking place in the piping of a ventilating system.

2. The length of the sound wave in air is equal to the velocity of propagation of sound in air in feet per second, divided by the number of vibrations per second.

3. The wave length of the fundamental tones of a man's voice in ordinary conversation is from 8 to 12 feet; the wave length of the overtones is much shorter.

4. The velocity of sound in air, and hence the wave length, will vary with the temperature and relative humidity. These variations can for all practical purposes be neglected, in so far as the use of voice tubes is concerned.

5. The velocity with which sound waves are transmitted varies with the density of the transmitting medium.

Thus:

Velocity in	caoutchouc	is	approximately	197	ft.	per	second
" "	air	"	"	1,093	"	"	"
" "	lead	"	"	4,030	"	"	"
" "	water	"	"	4,760	"	"	"
" "	pine	"	"	10,000	"	"	"
" "	copper	"	"	11,666	"	"	"
" "	iron	"	"	16,822	"	"	"

6. *In open space the sound waves are spherical* and hence follow the law that the intensity of the sound varies inversely as the square of the distance.

NOTE.—*This law does not apply to the case of voice tubes if they are straight and cylindrical.* In tubes the sound can be transmitted to great distances without perceptible alteration or loss of strength. The distance varies almost directly with the diameter of the pipe.

7. The loss of intensity of sound transmitted through tubes is due to three principal causes:

(a) Friction in the directional length of the tube.

[4] Taken from the article on "Voice Pipes."

(b) Yielding of the material from which the tube is made.

(c) Reduction of pressure due to leakage, or to the sudden expansion or contraction of the area of the tube.

NOTE.—*An open branch is equivalent to leakage.* A closed branch has the effect of being a sudden enlargement.

8. The laws of the reflection of sound are similar to the laws governing the reflection of light and radiant heat as follows, *i. e.:*

(a) The angle of reflection is equal to the angle of incidence.

(b) The incident sonorous ray and the reflected ray are in the same plane and perpendicular to the reflecting surface.

NOTE.—The following important considerations must, however, be borne in mind. These laws of reflection only hold when the *reflecting surface is large* in comparison with the wave length. The *efficiency of reflection* of sonorous waves is very much higher than that of heat or light. This efficiency is not known, but it is probably not less than 95 per cent and perhaps more nearly 98 per cent. A sound wave may be reflected several hundred times before it dies out. Large curved surfaces produce acoustical foci like luminous or calorific foci.

9. A 45° reflecting surface to produce a change of direction of 90° is not important for the long wave of 8 to 12 feet. For the higher notes, which mean shorter wave lengths, plain reflecting surfaces would be desirable were it not for the fact that it is the much shorter wave lengths we are trying to eliminate.

10. *Sound is strengthened by the presence of a sonorous body.*

NOTE.—Vitravius states that in the theaters of the ancients resonant brass vessels were placed to strengthen the voices of the actors. This is often cited, but is considered by many as a doubtful reference. The following two instances illustrate the strengthening of sound by this means:

(a) In 1909, in one of the vaudeville theaters of Boston, a musical performer using resonators strengthened the musical notes emitted by glass goblets. The sound was sufficient in volume to fill the entire theater, then one of the largest in the city.

(b) The large megaphone in use at the Union Station in Washington, D. C., is another very familiar illustration and has doubtless been heard by many in the naval service.

11. *Sound can be intensified by the use of diaphragms.*

NOTE.—(a) Two very familiar instances of this are the drum and the stethoscope. *It is essential that the air space behind the diaphragm be vented,* and that a piston-like effect be present. Nature has provided both a diaphragm and a vent in the ear.

(b) It was this failure to provide a vent behind the diaphragm that caused such contradictory results to be obtained during the Boston experi-

ments.[5] It was noted that the New York combined headpiece transmitted nearly as well with the valve closed as with it open, the only difference being a slight change in the quality of the sound. This valve was of the flap type, hinged on one side and made of aluminum, about *an eighth of an inch thick*. The design of the headpiece was such that the two branches to the earpieces were led off below the valve and thus served to vent the flap which acted as a diaphragm.

12. *Distinct speech and enunciation require that the nose, mouth and cheek muscles be not constrained in any way.*

NOTE.—The "Nose Mouthpiece" now so largely used on our naval vessels, which invites an operator to place his nose, *chin and cheeks* in close contact with the mouthpiece to get the desired intensification of sound, violates this principle.[6] Unquestionably the sound is louder, but many tests made by different officers on different vessels all disclose the fact that speech is perceptibly less distinct.

The sensation of hearing may be transmitted to the brain through several sources; through the aural canal primarily, but also through the bones of the body, and particularly through those of the head, and also through the resonance of certain cavities in the head, as for instance the frontal sinus.

The best that we can hope for is a more or less complete control of the first of these sources of hearing and to control it to such a degree that the excitation reaching the brain will be sufficiently strong to overshadow the others. Some of our gun-pointers and sight-setters are actually receiving orders through telephone receivers in close contact with the chest.

MATERIALS

The materials from which our voice tubes are made conform fairly well to the principles involved in sound transmission, except the rubber hose for flexible voice tubing.[7] The yielding inside surface of this rubber hose absorbs the energy in the sound wave. Apart from this it also has the practical difficulty of being very heavy, unwieldy, and the large sizes are not sufficiently flexible. This is particularly the case with the so-called flexible armored tubing. Rubber hose, after being in use

[5] See reference to U. S. NAVAL INSTITUTE PROCEEDINGS, page 1.

[6] Ref. Bu. C & R let. No. 17626-E. 139, May 31, 1912, Standard Plan 132. Bu. S. E. let. No. 49291-726, October 14, 1911.

[7] See leaflet specifications Nos. 34-H-4a, 34-T-1 and 44-T-5b, issued by the Bureau of Supplies and Accounts, Navy Department, Washington, D. C.

a little while, also kinks and collapses. This material should therefore be abandoned and only metallic flexible tubing be used. The service should however bear in mind that in emergencies, should all other communications be shot away, even common garden hose can be used to transmit orders over short distances.

Flexible Metallic Tubing.—There are several kinds of flexible metallic tubing.[8] The principal difference lies in the method of interlocking the spirals and in the presence or absence of various kinds of packing material, such as asbestos or rubber. Unpacked metallic tubing is more flexible than the packed, but it is not watertight *and does not carry sound nearly as well.* Hot packed air tubing is light and seems well suited for head sets. The spirals, however, are apt to loosen up with use, sometimes to such an extent as to make the tube leak pressure sufficiently to affect very seriously the *efficiency* of the tube.

Flexible metallic tubing is being made by a number of firms in the United States and is used in very large quantities by the large European navies.[9] Abroad the strength of the tube is tested by suspending the tube and attaching a weight to the lower end, the test weight being adjusted to the size of the tube. A requirement of this kind should be incorporated in our specification (34-T-1).

Voice Tubing.—Recently the use of galvanized steel tubing made up from galvanized sheet steel was authorized at the navy yard, Philadelphia, because of the inability of the government to obtain any other tubing with which to carry out changes in the fire control voice tubes. It is considerably lighter and less expensive than the standard steel tubing (Spec., 44-T-5b), and it is easy to make, and is durable.

Some doubt may be reasonably entertained as to the acoustical properties of this tubing because of its being painted inside and not so smooth as brass tubing. A highly glazed or polished interior surface of tubing is necessary to efficient sound transmission. This tubing is suitable for emergency work, but only for straight leads as it cannot be bent satisfactorily. This, however, is no great objection, as copper or brass tubing can

[8] See leaflet specifications Nos. 34-H-4a, 34-T-1 and 44-T-5b, issued by the Bureau of Supplies and Accounts.

[9] The Pennsylvania Flexible Metallic Tube Co., Phila., Pa.; The American Tube Works, Phila., Pa.

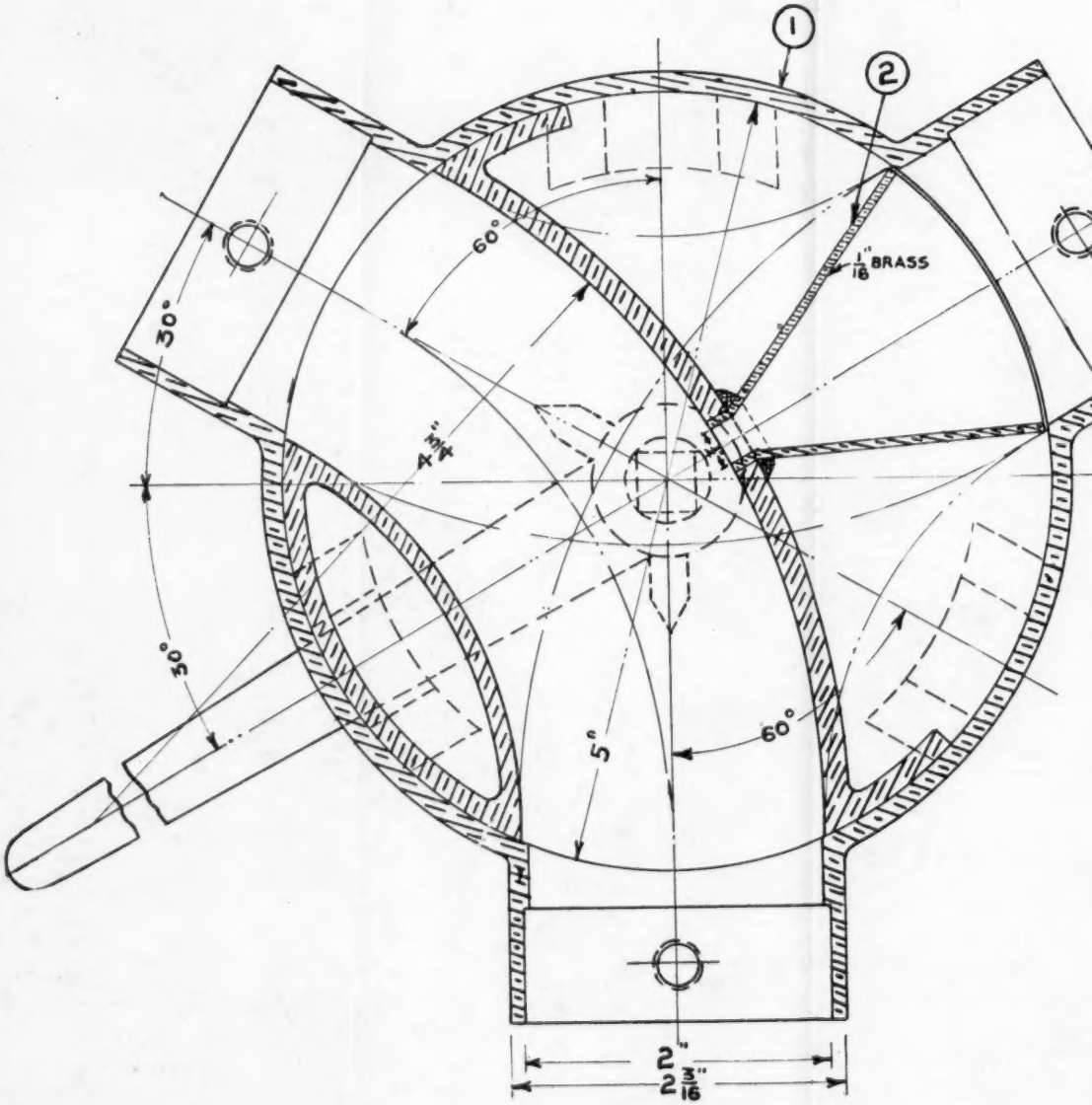
always be used where bends are necessary. Standard brass sleeve couplings are being used to connect the straight lengths of this tubing, and special precautions have to be taken to insure watertightness at the butt joints.

The use of aluminum for voice tubing will, it is feared, prove an expensive mistake. Acoustically, aluminum is entirely suitable, and its light weight makes it desirable, but the fact that it disintegrates and becomes brittle when exposed to the action of moist salt air and salt water, particularly when in contact with other metals, makes the material unsuitable. A test of this material is now under way, but it will take several years for the bad features to be made evident, and then the tubes might break under the shock of gun-fire and ruin the communication.

Very few of the fittings at present in use require any comment:

(a) The 2-way valve is absolutely wrong in design, but the 3-way valve is correct and is entirely suitable for use in long single leads through which it is necessary to communicate from intermediate points in the tube. The 3-way valve is also suitable for use at guns which may be called upon to receive orders (not simultaneously, of course) from two different points. On the folder opposite will be found a diagrammatic sketch, showing the lead of a tube from a foretop to a conning-tower, with outlets on the steering platform and the bridge. In order that a pipe of uniform diameter can be maintained from the foretop *A* to the conning-tower *D* without loss at intermediate points, 3-way valves should be used at the points *B* and *C*. If the 3-way valves be not used at *B* or *C* then a person speaking at either of those two points will transmit but one-half the energy of the sound wave to the conning-tower, because the sound wave will travel in both directions.

It is possible to provide the present 3-way valve with a "listening-in" device, if such be considered necessary by the sea-going personnel. A "listening-in" device to the present 3-way valve is also shown on the plan, *but it has not yet been tested out.* The loss of pressure through the ¼-inch hole to which the cone is attached will not seriously affect the transmission through the tube, and yet the sound wave passing through the small hole with an expanding arrangement will be sufficient to enable an operator to "listen in." Some experiments along this line are recommended.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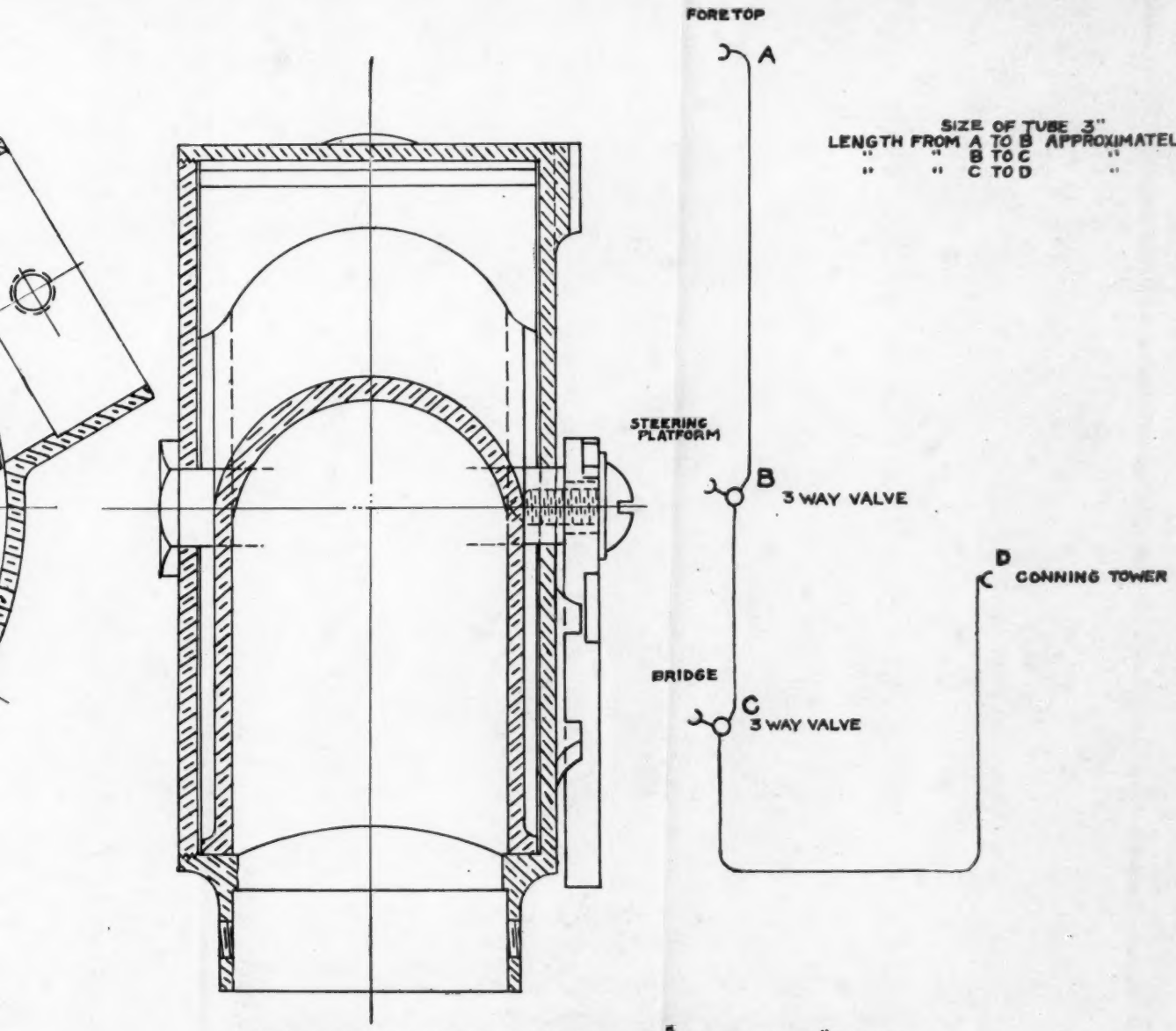


STANDARD 2"-3-WAY VALVE FITTED WITH 4" LISTENING IN DEVICE
AND
LINE DIAGRAM SHOWING VOICE TUBE FROM FORE TOP TO CONNING TOWER WITH TWO INTERMEDIATE OUTLETS PROVIDED WITH 3-WAY VALVE.

(b) Seamless copper voice tube fittings are now allowed, in place of cast brass fittings.[10]

(c) Voice tube terminal panels have now been eliminated and the outlets are simply installed in groups where necessary in single or double rows.[11] As a result of the elimination of terminal panels the following instructions now prevail as to the location of push buttons and annuciators:[12]

(1) In cases where the voice tube is not installed against a bulkhead or stanchion, but is brought out at a distance from the bulkhead, the push button is to be secured to the voice tube by a strap, the exact method of securing to be subject to the approval of the bureaus concerned.

(2) In cases where the voice tube is installed against the bulkhead the push button will be located on the bulkhead sufficiently far away to clear the voice tube cover when opened.

(3) Annunciators will be installed in such a location as to permit their being readily seen. When it is impracticable to install them directly on the bulkhead, owing to interference of voice tube or wiring leads, they will be mounted on a plate secured to a bulkhead. In all cases annunciators will be located over voice tube outlets in as nearly a central position as practicable.

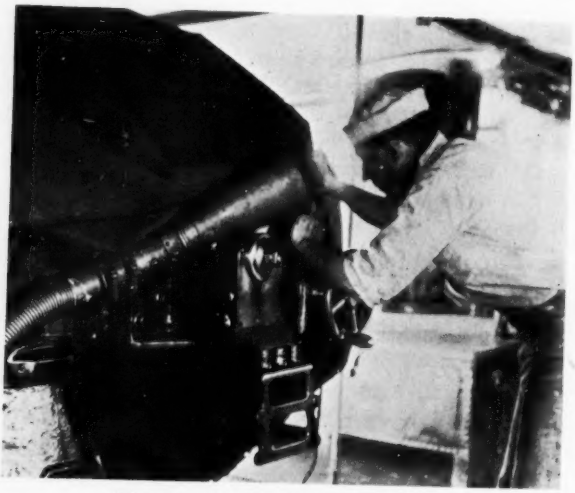
(4) The wiring to all push buttons, annunciators, etc., will be kept clear of voice tube outlets.

The covers to mouthpieces are now required to have label plates on both the inside and outside of the cover so that the lead can be instantly determined whether the cover be open or closed.

(d) Receiving head sets were a step in the right direction, but as designed they have proven to be very cumbersome and fatiguing, and not equal to the wear and tear of the service. On some vessels these receiving head sets have been discarded and short megaphones have been substituted, so located that the outlet is close to the sight-setter's or trainer's ear. Three of the photographs illustrate this point. *Receiving head sets are a necessity in turrets, steering engine compartments, and at other similar noisy stations,* even though relay stations may be near at hand. They are not absolutely necessary at the torpedo defence guns of our capital ships, nor on our destroyers. A light, efficient head set yet remains to be designed; it is safe to predict that this will not be accomplished unless tubing not greater than one inch in diameter can be effectively used.

[10] Bu. C & R let. No. 26-1, Z-44-t-5a, 15635-A-237, of August 3, 1916.
[11] Bu. C & R let. No. 26-20 (15635-A-256), of October 9, 1916.
[12] Bu. S. E. let. No. 198459-726-L, of October 13, 1916.

Receiving and Transmitting Head Set



Megaphone Terminal Receiver

Terminal at Torpedo Tube

(e) The diaphragm for voice tubes, plan 37534, for compartments under pressure may lead to further improvements in our voice tube systems, and further experimenting along this line is most desirable.

(f) The nose type of mouthpiece, C & R Standard Plan 132, calls for rather extended comment; more particularly because it is psychologically correct, but in some respects acoustically wrong in principle, and the balance between these two influences on the transmission of speech needs to be carefully adjusted. It is psychologically correct because it *suggests* to the transmitter the need for placing the mouth close to the mouthpiece. *This is necessary to increase the intensity of the sound, i. e.,* conserve the energy of the sound wave. *With the mouth but two inches away from the mouthpiece the energy is but one-sixteenth of what it is when the mouth is but one-half an inch away. It is acoustically incorrect in design because it requires the transmitter to place his lips and chin in close contact with the mouthpiece.* This interferes with the free play of the facial muscles, which is very detrimental to distinct speech. As a receiver it is decidedly less convenient and efficient than the old type. *Often these mouthpieces are found upside down or pointing sidewise so that none but a contortionist can use them as installed.*

This mouthpiece is sooner or later destined to be discarded. The history of its introduction is rather interesting.[13]

The mouthpiece first known as the "Hutchison" mouthpiece was tried out on the *Delaware* and was recommended by the Bureau of Steam Engineering on October 14, 1911, for application to important ship control and fire control voice tubes.

Reports were requested in every case where the installations were made, of which the following are extracts (the italicized parts of these reports do not appear in the original):

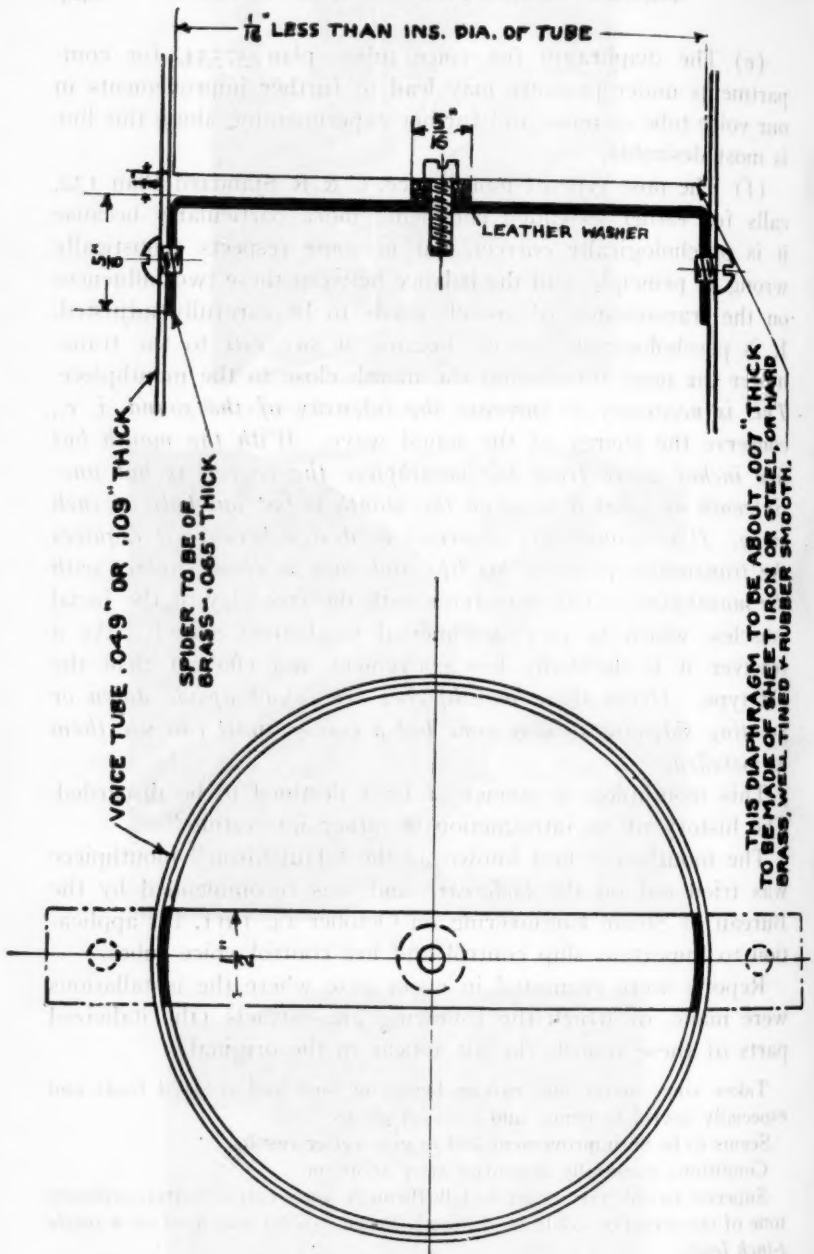
Takes voice better and carries better in long and *crooked leads* and especially useful in windy and exposed places.

Seems to be an improvement and to give better results.

Conditions materially improved after adoption.

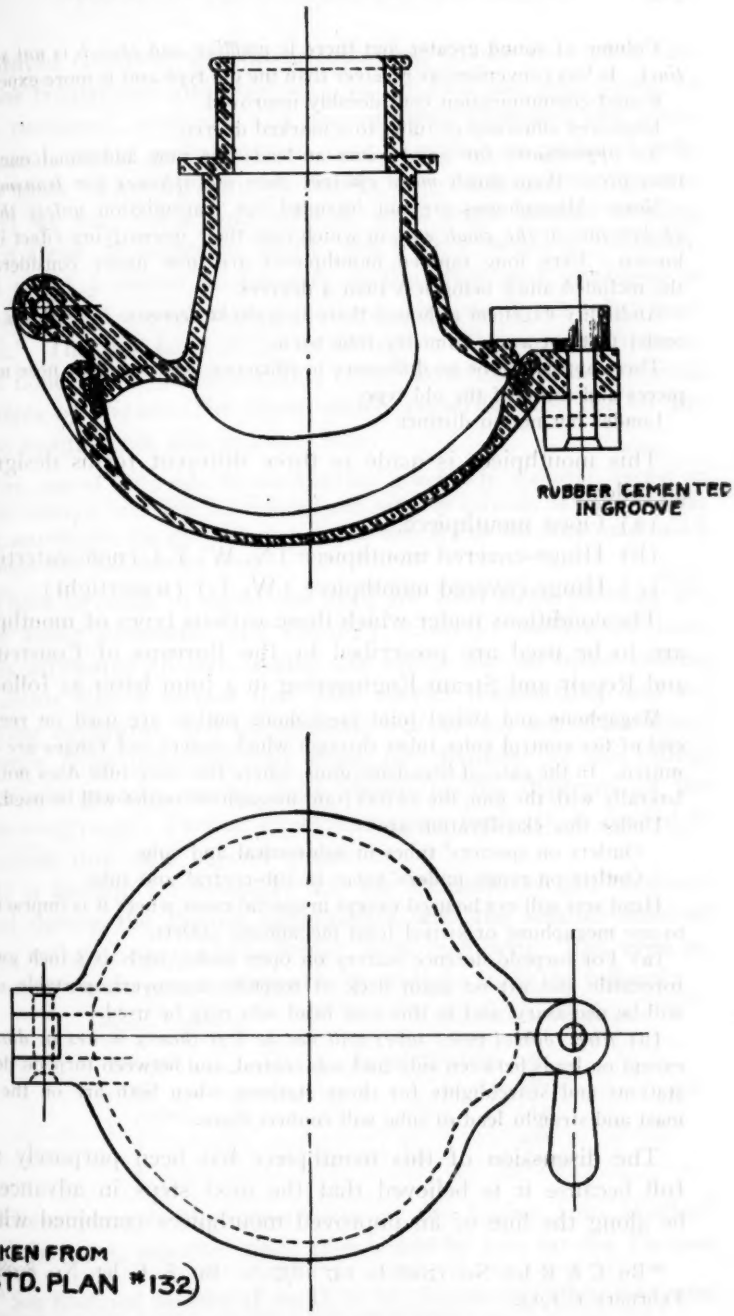
Superior to old type, easier to talk through, voice carries better, ordinary tone of conversation could be distinctly heard. *(This was tried on a single 4-inch lead.)*

[13] Research Data Memorandum, Bu. C & R 17626-E. 139, 17626-E. 147, June 15, 1916.


1/16" LESS THAN INS. DIA. OF TUBE
LEATHER WASHER
VOICE TUBE .049" OR .109" THICK
SPIDER TO BE OF BRASS—.065" THICK
THIS DIAPHRAGM TO BE ABOUT .007" THICK TO BE MADE OF SHEET IRON OR STEEL, OR HARD BRASS, WELL TINED + RUBBER SMOOTH.

DIAPHRAGM TO BE FITTED IN VOICE TUBE, ADJACENT TO MOUTH-PIECE ON PRESSURE END OF VOICE TUBE. ALL CASES

(Taken from C. & R. Plan No. 37534)



NOSE MOUTH PIECE FOR VOICE TUBING
W.T. COVERED MOUTH PIECE FOR FLEXIBLE HOSE.

Volume of sound greater, but there is *muffling and speech is not so distinct.* Is less convenient as receiver than the old type and is more expensive.

Found communication considerably improved.

Improved efficiency of tubes to a marked degree.

No opportunity for comparison as leads are new additional ones, but tests prove them much *more efficient than megaphones for transmitting.*

NOTE.—Megaphones are not intended for transmission *unless they be spoken into at the small end,* in which case their intensifying effect is well known. Very long tapered mouthpieces are now under consideration; the included angle being less than 4 degrees.

Audibility excellent although there is a *slight decrease in loudness* at the outlet farthest away from the tube used.

There appears to be no difference in efficiency between these nose mouthpieces and those of the old type.

Louder but not so distinct.

This mouthpiece is made in three different forms designated as follows:

(a) Open mouthpiece.

(b) Hinge-covered mouthpiece (N. W. T.) (non-watertight).

(c) Hinge-covered mouthpiece (W. T.) (watertight).

The conditions under which these various types of mouthpieces are to be used are prescribed by the Bureaus of Construction and Repair and Steam Engineering in a joint letter as follows:[11]

Megaphone and swivel joint megaphone outlets are used on receiving end of fire control voice tubes through which orders and ranges are transmitted. In the case of broadside guns, where the voice tube does not move laterally with the gun, the swivel joint megaphone outlet will be used.

Under this classification are:

Outlets on spotters' tubes in sub-central and subs.

Outlets on range finders' tubes in sub-central and subs.

Head sets will not be used except in special cases where it is impracticable to use megaphone or swivel joint megaphone outlets.

(a) For torpedo defence battery on open decks, such as 5-inch guns on forecastle and aft on main deck of torpedo destroyers, portable outlets will be necessary, and in this case head sets may be used.

(b) *Fire control voice tubes will not be less than 3 inches in diameter,* except on leads between subs and sub-central, and between torpedo defence stations and searchlights for those stations, when both are on the same mast and straight lead of tube will connect them.

The discussion of this mouthpiece has been purposely made full because it is believed that the next steps in advance will be along the line of an improved mouthpiece combined with an

[11] Bu. C & R let. No. 17626-E, 147 1837-A. Bu. S. E. let. No. 89083-726, February 1, 1913.

improved receiving apparatus, somewhat on the lines of a telephone transmitter and receiver. In the end one may expect to see combined receivers and transmitters provided for every terminal, except probably those now requiring megaphones only. For those requiring megaphones only (possibly for others as well) we may see a *long tapered*, small angle conical terminal piece about 48 inches in length, not over 2 inches in diameter, and about 5 inches in diameter at the large end, arranged in duplex or even triplex combinations with small tubes "in parallel." This will have all the advantages of the nose mouthpiece, and none of its disadvantages, either acoustical or mechanical.

Sizes of Pipes.—The letter which prescribes the use of the nose mouthpieces also requires that:

> Fire control voice tube be not less than 3 inches in diameter, except on leads between subs and sub-central, and between torpedo defence stations and searchlights for those stations, when both are on the same mast and a straight lead will connect them.

There is cause to doubt the need for such large pipes as are now being demanded and installed; cases of inefficiency have been attributed to size, which are really due to other causes. It seems almost certain that with correct transmitting and receiving apparatus, and installations that do not introduce interference from reflection and loops, the diameter of the tubing need not greatly exceed those shown by the diagram on the following page. Further experimentation, however, is needed to establish this view beyond question.

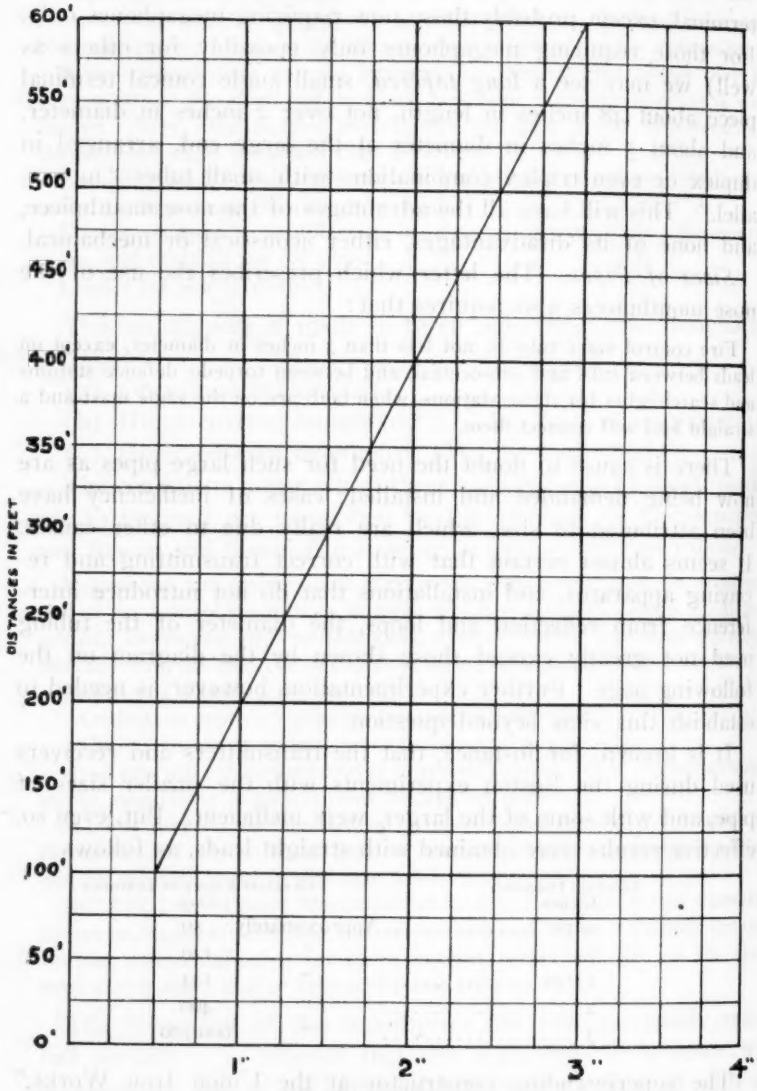
It is known, for instance, that the transmitters and receivers used during the Boston experiments with the smaller sizes of pipe, and with some of the larger, were inefficient. But, even so, effective results were obtained with straight leads, as follows:

Internal Diameter Inches		Greatest Effective Distance Feet
9/16	Approximately	50
¾	"	120
13/16	"	144
2	"	400
3	"	600-700

The superintending constructor at the Union Iron Works,[18] in July, 1905, reported upon tests made by him on the *Tacoma*

[18] See Electrical Booklet of the U. S. SS. *Tacoma* and *Ohio*, forwarded with letters 1309/04, August 2, 1904, and 1236/05, June 21, 1905.

DIAGRAM SHOWING RELATIONS BETWEEN DIAMETERS AND LENGTHS OF PIPE. SMOOTH BRASS STANDARD NAVY VOICE TUBING.



LOWER PART OF LINE IS DETERMINED FROM THE TEST MADE BY ASS. NAVAL CONSTRUCTOR H.S. HOWARD U.S.N. JAN. FEB.-1909- AND THE UPPER PART FROM THE BOSTON NAVY YARD BOARD TEST.

and *Ohio*. These showed that when speaking in an ordinary tone of voice *with the mouth near the mouthpiece and the ear within a few inches of the mouthpiece,* the following lengths of pipe were effective and satisfactory:

	Feet	Internal Diameter Inches
For lengths not exceeding	100	1
" " " "	210	1½
" " " "	300-400	2

The Board which conducted the Boston experiments recommended using the following:

	Feet	Internal Diameter Inches
Lengths not exceeding	75	1½
" " "	125	2
" " "	200	2½
" " "	300	3

The following sizes recommended independently by Commander R. W. McNeeley, U. S. Navy (then Lieutenant), who gave this subject much attention at that time (1908-1909), agree fairly well with those recommended by the Board:

	Feet	Internal Diameter Inches
For lengths not exceeding	100	2
" " " "	200	2½
" " " "	300	3
" " " "	400	3½
" " " "	500	4

At that time no length of 500 feet was required even in ships under construction or contemplated. Now we are exceeding this length and the question of installing relays is being considered.

We can now find many instances where 2-inch voice tubing and even 3-inch is used *on leads less than 30 feet in length,* which is entirely unnecessary. Why the then Bureau of Equipment, in acting on the Board's report, did not adopt the sizes recommended is not known. It adopted the following larger sizes which have been the specified sizes ever since, with the exception of fire control voice tubes:

	Feet	Outside Diameter Inches
For lengths not exceeding	100	2
" " " "	175	2½
" " " "	275	3
" " exceeding	275	4

As a matter of fact since the opening of the mouth in speech is usually less than a 2-inch circle there is no use whatever in making the main leads larger than 2 inches, and since the intensity of the sound varies as the square of the distance the mouth must be held close to the mouthpiece, but not in contact with it, and the entire energy directed from the mouth into the tube, and the ear must be as close to the receiver as conditions permit. In point of fact with tubes larger than 4 inches reverberations are very apt to be introduced which will render them inefficient.

The ordnance officer of the U. S. S. *Ohio,* then Lieut. Commander L. M. Nulton, U. S. Navy, went over Naval Constructor Tawresey's report and stated that his tests did not meet service conditions. The ordnance officer cited in support of this that

a 2-inch tube is not efficient to 300 or 350 feet.

Tubes from the forward bridge *to the engine rooms* (175 feet) "are useless," whereas, the 3-inch tube from the signal tower aft to the central station "works perfectly."

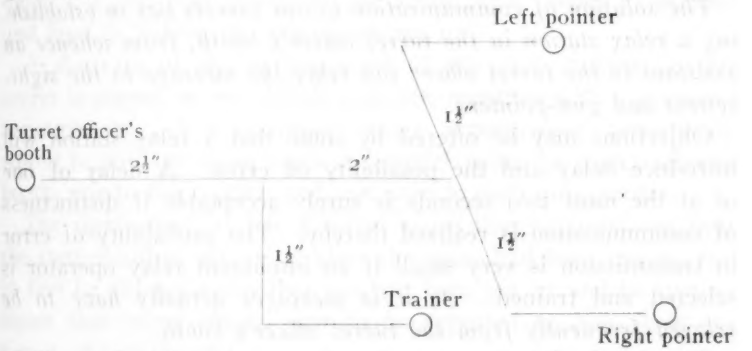
It requires but a moment's consideration to disclose the fact that the conditions as to noise in the vicinity of the receiving mouthpiece *in the engine room and in the central station* are totally different. The difficulty probably lay not in the size of the tube, but in the local noises.

A word of caution as to size of tubes is offered to the service: Analyze carefully the causes of inefficiency in a tube before demanding a larger one. In such an analysis bear in mind always that sound can be transmitted *to great distances in tubes without perceptible alteration in character or loss of strength,* and therefore that in all probability some other cause than the size of the tube may be the one. *Trace the tube throughout its full length* and make a complete diagram of the lead, to accompany any report that may be made. The diagram should show the type of terminals, size of tube, *the number and size of branches,* and the length and relative positions of these branches. The report should also show *whether the mouthpieces of branches are open or closed at the time of the test.* Loops and single branches *closed* at one end are very apt to interfere with transmission.

Finally, in those leads in which the direction of transmission *is primarily in one direction,* as for instance from a turret officer's booth to the gun-pointers and sight-setters, *the size of*

the tube should be reduced after each branch so as to maintain as nearly as practicable CONSTANT AREA. Enlargements in a tube tend to introduce muffling effect; taking a branch off, without reduction of area beyond it, is equivalent to an abrupt enlargement of the tube with *consequent reduction of pressure and may introduce muffling effect if the branch be a short one and closed when the main line is being used.*

Ordinarily in a two-gun turret, *if a single tube with branches is insisted upon,* the size of local control leads from the turret officer's booth to the trainer and the two sight-setters should be thus:



A 2½-inch main is for all practical purposes equal to one 2-inch branch and one 1½-inch branch; a 2-inch branch is roughly equivalent to two 1½-inch branches.

Branches not exceeding 75 feet in length need never be larger than 1½ inches, and branches not exceeding about 40 feet need never be larger than 1 inch.

Bear in mind, however, that *communication in the opposite direction* in leads thus designed will probably be less efficient than if a constant size of pipe had been used.

The following table of practical equivalents is recommended for designing leads of this nature:

Size of Main at Beginning	Equivalent to
3-inch	one 2½-inch... and one 1½-inch... or one 2-inch... and two 1½-inch... or four 1½-inch.
2½-inch	one 2-inch... and one 1½-inch... or three 1½-inch.
2-inch	two 1½-inch.

For all practical purposes losses of pressure due to friction may be neglected in the design of leads of this kind.

Relays.—It is safe to affirm that at noisy stations, such as engine rooms, dynamo rooms, blower rooms, steering engine compartments, auxiliary machinery rooms, *and in turrets,* the problem of effective voice tube communication will never be solved, *except by relay stations* situated in quiet booths, located as near as possible to the final point of communication. Booths of this nature are required in some of these locations by the general specifications for our vessels, *but not in turrets.* These should be included.[18]

The solution of communication to our turrets lies in establishing a relay station in the turret officer's booth, from whence an assistant to the turret officer can relay the message to the sight-setters and gun-pointers.

Objections may be offered by some that a relay station will introduce delay and the possibility of error. A delay of one or at the most two seconds is surely acceptable if distinctness of communication is realized thereby. The probability of error in transmission is very small if an intelligent relay operator is selected and trained. *As it is messages actually have to be relayed frequently from the turret officer's booth.*

The day is, I believe, not far distant when this fact will be realized by the service and a *complete fire control communication organization* provided which will include manning these relay stations. This will in all probability make 2-inch tubes effective for the service of all but the most distant parts of our vessels. For these, in all probability, with correct design, no tube need be larger than 3 inches.

Quite recently the Bureau of Steam Engineering expressed the opinion

> that owing to the increasing length of vessels, it will be necessary to install sound-proof voice tube relay stations for voice tubes leading to the after part of vessels of great length.

and that bureau has also recommended

> that all voice tubes running to the after part of the battle cruisers be run to a relay station, and it may be necessary to make a similar installation in

[18] Since this article was compiled "head booths" have been ordered placed in the engine rooms of destroyers, but a satisfactory design has not been developed.

later battleships *should it be found that the limit of length of the 4-inch tubes for efficient operation has been reached on them.*

Tests recently conducted on a number of battleships on the voice tubes *running from the plotting room to the after turrets disclosed the fact that communication* was generally unsatisfactory. On the *Texas,* however, this condition was improved by installing a relay station.

The location of the relay station on the *Texas* and a record of tests made thereon are not at hand, but some data is available from another vessel of the fleet.[17]

On this vessel a relay to turret No. 4 was put in at the after distribution station and it is reported that when the turret was quiet, *i. e.,* no drill going on, the sound was "twice as *distinct and loud* as before the relay was put in."

A diagram of the arrangement of the voice tubing in this turret is shown on the sketch opposite, together with a proposed arrangement. A very much better arrangement acoustically would be to have three leads in parallel from the turret officer's booth, one to the trainer, and one each to each gun-pointer.

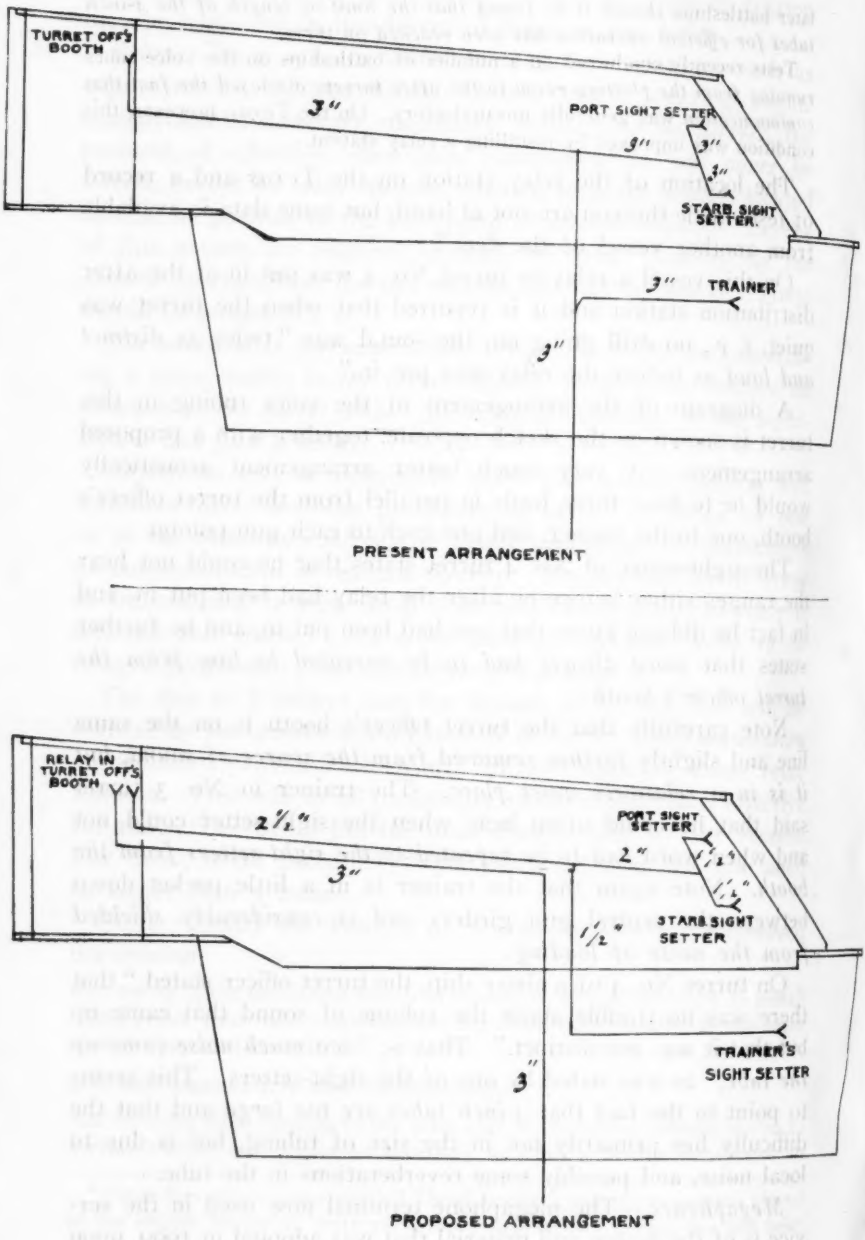
The sight-setter of No. 4 turret states that he could not hear the ranges either before or after the relay had been put in, and in fact he did not know that one had been put in, and he further states that *word always had to be repeated to him from the turret officer's booth.*

Note carefully that the turret officer's booth is on the same line and slightly *farther removed from the source of sound, but it is in a relatively quiet place.* The trainer in No. 3 turret said that he could often hear when the sight-setter could not and when word *had to be repeated to the sight-setters from the booth.* Note again that the trainer is in a little pocket down between the central gun girders *and is considerably shielded from the noise of loading.*

On turret No. 4 of a sister ship, the turret officer stated "that there was no trouble about the volume of sound that came up but that it was not distinct." That is, *"too much noise came up the tube,"* as was stated by one of the sight-setters. This seems to point to the fact that *4-inch tubes are too large* and that the difficulty lies primarily not in the size of tubing, but is due to local noise, and possibly some reverberations in the tube.

Megaphones.—The megaphone terminal now used in the service is of the design and material that was adopted in 1909, upon

[17] U. S. S. *South Carolina,* November, 1916.


TURRET OFF'S BOOTH
3"
PORT SIGHT SETTER
3"
3"
3"
STARB. SIGHT SETTER.
3" TRAINER
3"
PRESENT ARRANGEMENT
RELAY IN TURRET OFF'S BOOTH
2½"
3"
PORT SIGHT SETTER
2"
1½"
1½"
STARB SIGHT SETTER
TRAINER'S SIGHT SETTER
3"
PROPOSED ARRANGEMENT

the report of the inspector of equipment at the works of the New York Shipbuilding Company. It is made from sheet brass, the cone still has a 20° included angle, but the material is made thicker than .024 because of the wear and tear of service conditions. The sound intensifying effect of megaphones is well known to all, and it is possible that they may come into more general use aboard ship than is the case at present, and they may be used in connection with duplex and triplex mouthpieces for the purpose of excluding the effect of wind in exposed places and to better communicate through tubes in parallel.

During one of the experiments made at Boston a small megaphone was used in connection with a 3-inch pipe. It was found that messages could be transmitted, though not well, with the sender standing some 4 or 5 feet away from the end of the tube. It may be demonstrated later that a bell-shaped mouth, such as is used on phonographs, will be a distinct improvement.

Wind Interference and Air Currents.—It would not of course be possible in boisterous weather to transmit messages by megaphone to a voice tube terminal at a distance, but it is possible to provide "wind guards" for terminals in exposed places. This was shown in the earlier experiments on the *Illinois.* The wind guard tried on that vessel was crude but it gave efficient results. The Board unanimously agreed that with a wind guard on the bridge, and the insulated booth in the steering compartment, the installation was satisfactory *both for receiving and transmitting* messages. *Placing the end of a megaphone* over the end of a bridge terminal will serve as a wind guard.

In a letter from the Bureau of Construction and Repair, dated February 27, 1909, that bureau conveyed a number of suggestions to the Boston Board, made by various ordnance officers of the fleet. One of these suggestions dealt with the subject of air currents.

> Would not a current of air through a tube assist materially in sound transmission, such as putting sub-stations under slight air pressure?

The answer for this, of course, is clearly in the negative. Now the service has been compelled to adopt a diaphragm to stop air currents in voice tubes connecting compartments under air pressure, and in long vertical leads.[18]

[18] Bu. C & R let. No. 26-2, April 27, 1915 (15635-A-87).

Echoes, Closed Branches and Loops.—A very sharp, quick sound can produce an echo when the reflecting surface is 55 feet distant; at least double that distance is necessary for articulate sound to be repeated.

A person cannot pronounce or hear distinctly more than five syllables a second, and therefore a reflecting surface at a distance of 112.5 feet would not cause an interference by echo. In this case the sound would have to travel 225 feet and take about one-fifth of a second, *i. e.*, the time required to enunciate one syllable.

When the distance of the reflecting surface is less than 112.5 feet the direct and the reflected sound are confounded.[19]

At Boston, with a 3-inch pipe about 130 feet long, it was found possible to obtain a very loud echo, whereas this did not occur, or at least was not noticed, with 1-inch and 2-inch piping. The echo did not seem to interfere with communication. Echoes may interfere, however, with communication and in a way that is positively dangerous. On the *Pittsburgh,* formerly the *Pennsylvania,* a 3-inch tube was fitted from the bridge to the engine room, and its service required the operator in the engine room to repeat the order received. This the tube did automatically by echo. This might easily have led to a belief on the bridge that the message had been received correctly when such was not the case.

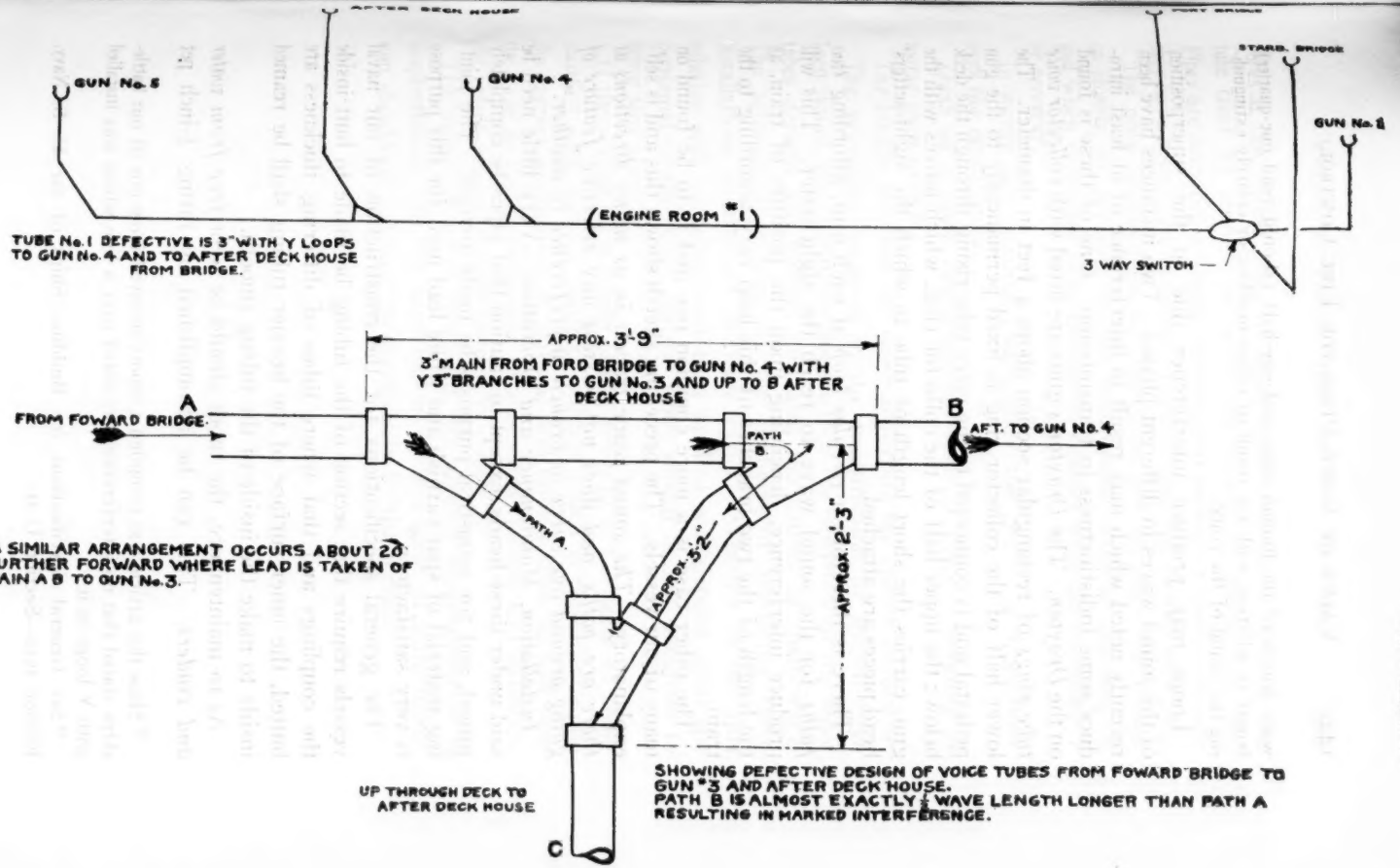
Branches, aside from lessening the carrying power of a tube, may introduce interferences if the branch be closed at the end. A case of this kind was recently found to exist on one of our destroyers.[20] The danger of interference from this cause was pointed out some eight years ago in the following terms:

> The practice of fitting branches in voice tubes to communicate with more than one point should be absolutely abandoned, for the simple reason that unless the branches occur at proper intervals it is a very easy matter to get sound interference.
>
> The Board desires to call particular attention to the danger of interference that may arise from taking branches off a main for short lengths, and in using a tube having these branches closed.[21] It can very easily happen under these conditions that the length of the branch is a multiple of the

[19] Ganots—Physics.

[20] U. S. S. *Paulding,* November 8, 1916. Lead to No. 1 gun on forecastle which is about 51 feet in length—3-inch tube.

[21] Convened at navy yard, Boston, Mass., on February 9, 1909.


GUN No. 5
GUN No. 4
STARB. BRIDGE
GUN No. 1
(ENGINE ROOM "1")
TUBE No. 1 DEFECTIVE IS 3" WITH Y LOOPS TO GUN No. 4 AND TO AFTER DECK HOUSE FROM BRIDGE.
3 WAY SWITCH
APPROX. 3'-9"
3" MAIN FROM FORD BRIDGE TO GUN No. 4 WITH Y 3" BRANCHES TO GUN No. 3 AND UP TO B AFTER DECK HOUSE
A
FROM FOWARD BRIDGE
B
AFT. TO GUN No. 4
PATH B
PATH A
APPROX. 5'-2"
APPROX. 2'-3"
A SIMILAR ARRANGEMENT OCCURS ABOUT 20' FURTHER FORWARD WHERE LEAD IS TAKEN OF MAIN A B TO GUN No. 3.
UP THROUGH DECK TO AFTER DECK HOUSE
C
SHOWING DEFECTIVE DESIGN OF VOICE TUBES FROM FOWARD BRIDGE TO GUN "3 AND AFTER DECK HOUSE.
PATH B IS ALMOST EXACTLY ½ WAVE LENGTH LONGER THAN PATH A RESULTING IN MARKED INTERFERENCE.

wave length of the human voice and one-half (should read one-quarter) length in addition, with the result of either muffling or entirely extinguishing the sound of the voice.

Loops may produce interference due to the superposition of the sound waves in different phases. Two instances have been recently noted which may result in interference or at least introduce some indistinctness in transmission. One of these is found on the *Drayton*. The *Drayton's* guns are fitted with *collector voice tube rings* of rectangular section about 4 feet in diameter. The lower half of the collector ring is fixed permanently to the gun pedestal and is connected to the voice tube rising through the deck below; the upper half of the collector ring, which moves with the gun, carries the short length of tube to which the sight-setters' head pieces are attached.

There is therefore a *circular loop* at each gun, affording *two paths* for the sound wave to reach the sight-setter. This will produce interference, depending upon the position of train, as the length of the two branches of this loop vary according to the train.

The other case is a more common one and is to be found on many of our vessels. The preceding sketch shows this and is self-explanatory. *The sound wave travels in as many directions as there are paths, and does not possess any selective feature of going around one curve or branch in preference to another.*[22]

Installation, Maintenance and Operation.—Very little need be said under these heads, except to caution that pipes be completely joined, and for acoustical purposes be made *airtight*. The jointing material of spar varnish and white lead used for this purpose is very satisfactory.[23]

The general specifications for the construction of our naval vessels require that section of the tubing be made to butt inside the couplings and that where tubes of differing thickness are butted, the inner surface of the heavier tubing shall be reamed inside to make the inside of the tubing smooth.

As to maintenance, the tubes should be kept *free from water and cinders*. This can be accomplished by fitting ½-inch pet

[22] Since this article was compiled a report received from one of our battleships stated that no interference was noted over a line which was installed with Y loops in it.

[23] See General Specifications for Building Ships of the U. S. Navy, Edition 1912—Section U-21.

cocks at the lowest parts of leads, and periodically blowing the tube clear of cinders or water by means of compressed air. Pipes are sometimes found crushed and broken or closed because they have been used as points of attachment for tackles and gear.

The only instructions for operation are to place the mouth as closely as possible to the mouthpiece *without touching it* and when receiving have the ear in *contact with the mouthpiece or receiver.*

In windy and exposed places place the end of a megaphone *over the mouthpiece.*

Speak in a plain conversational tone of voice. Shouting is worse than useless.

The longer the lead the more deliberate the speech should be.

The principles involved in the transmission of speech have been stated, the conditions upon which the efficiency of the voice tubes depend are known, and also the causes of inefficiency. The solution, therefore, of the problem of rendering these installations satisfactory is made easier. Whether or not this solution will be found and then applied will depend upon the personnel of the navy, and no stone should be left unturned to bring this about.

If the service as a whole can be brought to the point of being satisfied with nothing short of success which is dependent upon the correct application of natural and known laws, as has been the case in the development of electricity, steam, and ballistics, the result will no longer remain in doubt.

The value of voice tubes for fire control communication is unquestioned, and the development of this form of communication should be followed up assiduously by the service.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

NEW DETAILS OF THE *RANDOLPH-YARMOUTH* NAVAL BATTLE

By EDGAR STANTON MACLAY

Some time before the close of the eighteenth century Admiral Nicholas Vincent, R. N., who as a captain commanded the British 64-gun ship of the line *Yarmouth* in her dramatic action with the United States 32-gun frigate *Randolph,* March 7, 1778, authorized the publication of a statement giving details of that battle which, so far as the writer knows, have never been given in their entirety to the American public. This " statement " appeared in the form of a " broadside," printed on one side only of a single sheet of paper, size about 10 by 16 inches and containing about 1000 words. It seems that only a small edition of this " broadside " was published, for the paper is regarded by English collectors as " rare " and, so far as the writer knows, only one copy is preserved in America.

As is well known, South Carolina, early in February, 1778, sent a naval expedition to capture a quantity of military stores which were known to be on the island of Tobago, at the extreme southeastern West Indies. The expedition was under the command of Captain Nicholas Biddle, U. S. N., who had his flag on the 32-gun Continental frigate *Randolph.* With him were the 18-gun ship *General Moultrie,* the 16-gun brig *Notre Dame,* the 16-gun brig *Polly,* the 14-gun brig *Fair American* and an armed schooner, all belonging to South Carolina.

The squadron had nearly reached its destination when, on March 7, about 150 miles east of Barbadoes, it fell in with the *Yarmouth.* Realizing the hopelessness of arraying his scattered forces against the concentrated power of the " dreadnought," Biddle signaled his vessels to make sail in flight while he stood down to engage the " Goliath of the sea " single-handed—hoping

to detain and damage her enough to prevent her capturing the other vessels of the American squadron. The temerity of Biddle's sacrifice is more apparent when we realize that, not only did the *Yarmouth* carry twice the number of guns aboard the *Randolph*, but the calibers of the cannon in the "dreadnought" were larger, so the *Randolph* was pitted against an antagonist of three times her weight of metal.

The general result of this unequal contest is well known. After engaging the *Yarmouth* at close quarters for nearly an hour, a shot penetrated the *Randolph's* magazine and she blew up—311 of her complement of 315 officers and men perishing. But Biddle had accomplished his purpose—all the other vessels of the American squadron, excepting the schooner, escaping. Admiral Vincent's "broadside," however, not only gives additional details of this notable ship-duel, but gives an interesting account of the fate of the four surviving American seamen. The writer begs to acknowledge the courtesy of the managers of "Baker's Great Book Shop" in John Bright Street, Birmingham, England, who put him on the track of a copy of Admiral Vincent's "broadside," which is given in full as follows:

A REMARKABLE INSTANCE OF FOUR MEN BEING PROVIDENTIALLY SAVED

On the 7th of March, 1778, between five and six o'clock in the afternoon, his Majesty's ship *Yarmouth* (Captain, now Admiral Vincent) being in the latitude of the island of Barbadoes and about fifty leagues to the eastward of it, the man at the masthead called out that he saw several sail to leeward, near each other. Soon afterward there were discovered from the gun-deck six sails—two ships, three brigs and a schooner, on the starboard tack, all sails set and close to the wind, then about northeast. The captain and officers of the *Yarmouth* had not the least doubt of their being American privateers. For even a single merchant ship which had not a letter of marque was, perhaps, never seen upon a wind in the latitude of Barbadoes, and forty to fifty leagues to the east of it, and the wind easterly.

The *Yarmouth* accordingly bore down upon them and, about nine o'clock got very near to the largest of the two ships, which began to fire on the *Yarmouth*, before the *Yarmouth* did on her. In about half of an hour she blew up, being then on the *Yarmouth's* lee beam, and not above three or four ships' length distant. The rest of the squadron immediately dispersed. The damage the *Yarmouth* received in her masts, sails and rigging was prodigious and she had five men killed and twelve wounded. A great variety of articles were thrown into her—one, an entire American ensign, which was not even singed or torn.

This happened between nine and ten o'clock Saturday night. On the Thursday following, the *Yarmouth* being in chase of a ship, steering about west (the wind in the northeast quarter), the man at the masthead called down to the officer on the quarter deck, that he saw something on the water, abaft the beam (the starboard), but could not tell what to make of it. A question immediately arose, what was to be done? If the *Yarmouth* hauled up to see what it was, there would be little or no chance of coming up with her (the chase) before dark. Humanity, however, pleaded for it and prevailed. Accordingly she hauled her wind and by the help of a spy-glass, discovered four men, that seemed to be standing on the water; for what supported them was not at first visible. In two or three hours she got up to the little float on which they stood, and brought them on board. The captain and officers were greatly surprised to find they belonged to the ship that was blown up the preceding Saturday. So they had been five whole nights and nearly as many days floating on the waves, and buried alive, as it were, under the vault of heaven. Being young and hardy, they did not appear much discomposed when they came on the quarter deck. They said they were not hungry, although they had not eaten anything, but [were] thirsty and very sleepy. A bason [spelled this way in the original] of tea, however, and a hammock to each perfectly restored them in a few hours. When they arose, the only complaint they had, was that of their feet being greatly swollen, by having been so long in the water.

The account they gave of themselves was only this—that they were quartered in the captain's cabin and [were] thrown into the water without receiving any hurt. But they could give no account by what accident the ship blew up.

Being good swimmers, they got hold of some spars and rope with which they made the raft on which they were found. And, providentially for them, they picked up a blanket, which served them as a reservoir of water; for during the time they were on the raft, there fell a few showers of rain, of which they saved as much as they could in their blanket, sucking it from time to time, which, no doubt, preserved all their lives.

On the arrival of the *Yarmouth,* two days after, at Barbadoes, proper officials came on board in order to take the depositions of these four men, respecting the blowing up of the ship, etc., and particularly as to the number of men on board her when the action began. For without a certificate to this purpose, the treasurer of the navy had no authority to pay the head-money allowed by the Government, which is five pounds a head and which, on this occasion came to 1575 pounds. Thus this little act of humanity seems to have been rewarded. They deposed that the ship which blew up was called the *Randolph* of thirty-six guns, twenty-six of which were twelve pounders, and her complement of men three hundred and fifteen. The other ship was called *General Moutray* [*General Moultrie*], but the number of her guns or her complement of men, or of the force of the three brigs, Admiral Vincent told the writer of this account, he could not precisely ascertain. The schooner was [made] a prize.

The captain of the *Randolph* was the commodore of this little squadron, which had sailed just a month from Charlestown, South Carolina, where

it was fitted out with the design of attacking the island of Tobago, for which they were steering when they first saw the *Yarmouth*.

In a foot-note the writer of the above account states that, afterward, it was learned that the merchantman the *Yarmouth* was chasing when she discovered the four men on the raft, was a British West Indiaman—so Captain Vincent suffered no pecuniary loss when he gave up that chase in the cause of humanity.

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OUR NAVY AND THE WEST INDIAN PIRATES

(CONTINUED)

A DOCUMENTARY HISTORY

By REAR ADMIRAL CASPAR F. GOODRICH, U. S. Navy

Of the vessels of Porter's squadron, we only know positively that the *Terrier,* Lieutenant Paine, was continuously in the West Indian waters during that summer. On August 17, she captured, off Havana, a piratical launch and six men,[1] and on August 26, a schooner at Bahia Honda.[2]

Again we are indebted to Mr. Randall. Under dates of September 6 and 15, he gives accurate information as to the organized system by which piracy was fostered and by which it was able to flourish to an extent now incredible; winked at, if not indeed encouraged, by the local officials. He writes to the Secretary of State, under date of September 6, from Havana, as follows:

. . . . At the same time, the brig *Industry,* of Baltimore, when in the harbor of Matanzas, and only a few miles from the city, was attacked by five piratical boats, which were beaten off. The firing was distinctly heard in Matanzas. A Spanish brig of war lay in the port, but no efforts were made to capture the boats. . . . .

Large quantities of their plunder are known to have been introduced by the pirates into Matanzas, and are vending there at prices which, alone, betray the nature of the property. Many articles, of a peculiar fabric, and known not to have been regularly introduced, are seen there constantly, such as French hats, of the newest fashions, on the heads of vulgar ruffians. The retailers of goods are seen travelling to the coast with pack-horses, for the known purpose of making purchases from the pirates. A respectable Englishman, who keeps the ferry near the city, informed me that the returns from his ferry give certain indications when prizes are on the coast, from the number of persons who resort from Matanzas to their

[1] MWHP; E, 78; NEE, 310.
[2] Log *Terrier;* CHN, III, 28; NEE, 310.

rendezvous. No effectual measures are taken to stop this traffic. If, occasionally, goods are seized in the attempt to smuggle them into the city, the affair terminates by their condemnation, or being taken by the officers of the customs, and nothing more is heard of it. Persons, known to be pirates, walk the streets unmolested, no one being willing to incur the risk of denouncing them.

. . . . Information having been given to Capt. Graham, of the British sloop of war *Icarus*, an expedition was fitted out in his boats, which proceeded to Baya Honda, on the 21st ult. succeeded in capturing two pirate vessels, and in killing several of the pirates. On the approach of the boats, the pirates, about 40 in number, fled into the bushes. On board one of the pirate vessels were confined the captain and crew of the brig *Henry*, of Hartford, Conn. who were most seasonably released. The *Henry* was captured on the 16th ult. bound from a port in Mexico to Matanzas, with a cargo of mules. The captain and his crew were treated with the accustomed cruelty of those ruffians, and were designed to be killed the next day, after they had assisted in landing the mules. The *Henry* was dismasted and stripped.

In the bay, were found the wrecks of 12 vessels, recently destroyed by the pirates, the crews of all of which are supposed to have been murdered. Some of the vessels were very large, and the British officers computed that their crews could not have consisted of a less number than one hundred and twenty persons. . . . . Some of the crew of the *Henry* were told by the pirates, that all those vessels, 12 in number, had been captured and destroyed by them; and, upon being asked what had been done with their crews, they very significantly shrugged their shoulders, but gave no answer.

. . . . Captain Graham states that the Governor of the Isle of Pines had, a short time before, presented to this notorious pirate an elegant pair of pistols. On the destruction of his party by the English, this same Governor claimed great merit for the aid he afforded. I have also been told, and have reason to believe, that the Spanish brig of War *El Marte*, Don Jose Apodaca commander, a few days since fell in with, and boarded, a pirate vessel, the consort of those destroyed by the boats of the *Icarus*. The visit terminated, however, in mutual civilities. The officers of the man of war received various presents from the pirates, and let him pass, although his character was well known to all on board. The pirate urged that he only cruized against *the enemies of Spain*. The account is given by a seaman who was on board the *Marta*, and visited the pirate. . . . .[3]

Again, on September 15, Mr. Randall writes to the Secretary of State and says:

The pirates at Key Sal, and to the windward, have lately received an increase of numbers, which threatens to give more extensions to their ravages. Several slave vessels, and others, were captured by a Colombian privateer, and their crews, to the number of 140 men, sent into Matanzas. A large number of those desperadoes stole boats, and left that place avowedly to join the pirates. . . . .

[3] FR, V, 494.

Some persons have been lately arrested at or near Baya Honda, and sent in custody to this city, charged with being concerned in the late piracies committeed in that quarter. Some of them belong to Regla, a village in this harbor, which has ever been the *head quarters of* the pirates. . . . .[4]

As the Spanish authorities in the West Indies sheltered their apathy under the thin pretext that the government at Madrid was alone empowered to deal with international relations and the subject of co-operation with our naval forces, our Minister to Spain, on September 7, addressed a strong letter of protest and warning to Don Luis Maria de Salazar, Secretary of State, demanding prompt action and reparation for damages done to American shipping by pirates operating from Cuba.[5]

No practical answer to these remonstrances was ever made, and the depredations on our commerce continued without interference by the Spanish Government. On "October 11—The brig *Edward,* Langham, was captured in the Mona passage. The captain was killed on the spot. Three men escaped in a boat who gave the above information."[6]

Mr. Mountain informs Mr. Randall of this atrocity, in a letter dated at Havana, November 25:

Piracies are not at an end: we learn, via Nassau, that the brig *Edward,* of New York, Dillingham, master, from France, has been taken by the pirates, on the 15th day of October, off Cape Maise, by four boats, manned by Spaniards. The captain and crew were murdered, except the Supercargo and three men, who made their escape in an open boat, and, after 15 days' exposure, landed in a small key near Turks Island, and from thence were taken to Nassau, New Providence.[7]

Another capture occurred a few days later:

October 21—The brig *Laura Ann,* Shaw, of New-York, was captured off Port Escondido; the captain and two mates hung, and the remainder of the crew murdered with the exception of one man who hid himself and escaped by swimming. The brig was burnt. About the same time a brig and schooner were taken—the crews murdered.[8]

However, the pirates were not having things altogether to their liking, since, on "October 16th—the U. S. brig *Enterprise,* off Cape St. Antonio, took four schooners and a sloop, in the act of robbing several vessels."[9]

[4] FR, V, 496.
[5] N, November 6, 1824.
[6] MWHP.
[7] FR, V, 499.
[8] MWHP; NEP, November 15 and 19, 1824. *Vide* Introduction.
[9] MWHP.

On October 20, the *Porpoise,* Lieutenant C. W. Skinner, near Matanzas, took a piratical schooner as prize and the same day her boats, under Lieutenant Hunter, seized three piratical boats in Sigaumpa Bay.[10] His official report is as follows:

U. S. SCHOONER "PORPOISE,"
MATANZAS, 24th October, 1824.

Sir: I have the honor to inform you that, after leaving the convoy from Havana, I stretched in for this port, where I anchored on the evening of the 18th. On inquiry, I was informed no piracies had recently been committed in this vicinity. I, however, determined to despatch the boats secretly from the harbor, and examine the adjacent bays and inlets. On the night of the 19th, I placed them under command of Lieut. Hunter, and acting Lieut. Johnson, with orders to examine about point Yeacos, Sewappa and Camrioca, places long notorious as a retreat for pirates. On the evening of the 22d, Lieut. Hunter returned with a piratical schooner of one carriage gun, one new American cutter, and two other boats; one, having three men on board, he captured in Sewappa bay. Every appearance justified the suspicion of piracy. The persons informed Lieut. Hunter their vessel had been taken by armed men; the boat they were in given in exchange, with a promise of returning in a few days and restoring their vessel. The next day, off Camrioca, Lieut. Hunter discovered a suspicious schooner standing to sea, in chase of a vessel in sight. On his approach, the schooner tacked, and made for the shore, closely pursued by the boats. The crew abandoned the vessel, and fled to the wood, where they were sought for in vain; she proved to be a pirate, mounting one gun, and small arms. From the number of nautical instruments, trunks of clothing, rigging, and sails, with three sets of American colors, found on board, she must have robbed several vessels. From stains of blood on the clothes, and other articles on board, I fear the unfortunate persons to whom they belonged, must have been murdered. No papers were discovered which could lead to the name of the vessel or vessels captured: several articles of clothing were marked "Captain Shaw," a number with the initials "A. S." A bag on board was lettered "brig *Morning Star's* letter bag." One waistcoat contained in the pocket a printed card, "Mr. M. Loris's boarding house, Charleston, South Carolina," and appeared to have been newly printed. A medicine chest on board was put up in New York. I have delivered the prisoners to the Governor of Matanzas, and shall furnish him all the testimony in my power which can throw light on their character. The schooner I sent out last night, under command of acting Lieutenant Browne, in hopes of decoying some of her former comrades. I sail with convoy to-morrow, and after joining the prize at sea, shall proceed to Thompson's Island for supplies, and return to the protection of commerce on this coast. I trust, sir, should the prize be sufficiently fortunate to meet with pirates, I shall have the pleasure to give a satisfactory account of them.

[10] N, November 6, 1824; E, 78; Log *Porpoise;* S. O. (O. L.) LXXXVI, 112; CHN, III, 28.

I do myself the honor to enclose the correspondence relative to the capture of the vessels and prisoners.

I have the honor to be, respectfully, sir,

Your obedient servant,
CH. W. SKINNER.

To the Hon. Samuel L. Southard,
Secretary of the Navy, Washington City.[11]

Having somewhat recovered his health, Porter sailed for his station in the *John Adams,* leaving Philadelphia early in November.[12] Other vessels of his squadron had also returned to the West Indies, with the following results:

On October 27, the *Beagle* captured a piratical sloop off Crab Island.[13] The crew escaped, but six were taken prisoners by the local authorities.[14]

November 4—The U. S. schooner *Porpoise* captured a piratical boat off Cape St. Antonio. Crew escaped.[15]

November 11—The U. S. schooner *Terrier* re-captured from the pirates, the French ship *Calypso* and cargo. The pirates on board were also taken.[16]

A brief account of this last-mentioned capture is as follows:

Several captures of boats, &c., have been made by our small vessels, cruising off the coast of Cuba; but the pirates have, very generally, made their escape, though some have been taken. The fine French brig *Calypso,* with a full cargo of coffee, has been recaptured from the sea-robbers, by the United States schooner *Terrier,* lieut. Paine, after they had had possession of her for five days. The pirates who had charge of her were made prisoners. Com. Porter has by this time arrived, and will give increased energy to this harassing and dangerous service; but we fear that the *trade* cannot be broken up, unless authority is given to pursue and capture on the land as well as on the water.[16]

Soon after the return of Porter to the West Indies, what is known as the Foxardo affair occurred. This episode, for its sequel, deserves careful treatment, but to deal with it at length here would interrupt the narrative which only undertakes to place on record, consecutively, the depredations of the pirates and the activities of our cruisers. For this reason only is it referred to in these pages. The following is a very brief account:

On the 26th of October Lieutenant Charles T. Platt, of the *Beagle,* learned that the storehouse of the American consul at St. Thomas had been

[11] N, November 20, 1824.
[12] N, November 6, 1824.
[13] Vieques Island, just east of Porto Rico.
[14] NEP, November 22, 1824.
[15] MWHP; NEP, December 16, 1824.
[16] N, December 25, 1824.

broken into and goods valued at five thousand dollars taken from it. It was believed that the stolen property had been carried to Foxardo, a small port on the eastern end of Porto Rico. Lieutenant Platt anchored off that port, and, waiting upon the civil authorities informed them of his mission and asked their assistance in recovering the plunder and apprehending the robbers. The town officers treated him with great incivility and as the American lieutenant had landed without his uniform they demanded his commission. On his producing that paper it was pronounced a forgery, and Lieutenant Platt was arrested on the charge of being a pirate. He and Midshipman Robert Ritchie, who accompanied him, were placed under arrest, and were only released and allowed to return to their vessel after being subjected to great indignities. On hearing of this affair, Captain Porter, having his flag on the *John Adams*, anchored off the port with the *Beagle* and the *Grampus*, and the boats of the *John Adams*, under the command of Master-Commandant Alexander James Dallas, ran into the harbor. In a letter dated November 12th, addressed to the alcalde, Captain Porter demanded an explanation of the treatment the American officers had received, giving that magistrate one hour for an answer. The letter was sent by a lieutenant under the flag of truce. While waiting for an answer, Captain Porter noticed that preparations were being made in a shore battery to fire on him, whereupon he detailed a detachment of seamen and marines, who captured the battery and spiked the guns. Captain Porter now landed,[17] and, after spiking a 2-gun battery that commanded the road, he reached the town in half an hour. Finding that the people were prepared to defend themselves, he halted to await the flag of truce. In a short time the alcalde and the captain of the port appeared and offered ample apology to Lieutenant Platt for the indignities to which they had subjected him, and expressed regret at the whole occurrence, upon which the Americans returned to their ships.

This affair incurred the displeasure of the United States Government, and, in an order dated December 27, 1824, Captain Porter was ordered home, and on being tried by court-martial he was sentenced to be suspended from the service for six months. Believing that he had been wronged, Captain Porter resigned, and entered the Mexican navy, where he remained until 1829, when he was appointed by President Jackson as United States consul-general at Algiers. Afterward he became the Minister to Turkey, and he died at Pera, March 28, 1843. His body was brought home and is buried in the grounds of the Naval Academy [then] at Philadelphia.[18]

Since our history abounds in cases of abuse of the pardoning power by weak Presidents and Governors, it is not surprising that pirates should, in their turn, profit by a maudlin sympathy which subordinates the interest of the state to the comfort of the individual. Undeterred by the illuminating example of the Baratarians, who promptly returned to their evil practices when

[17] November 14—E, 78.
[18] M, II, 38 *et seq.*

pardoned, and by other pardoned criminals of the same kidney, the regrettable custom seems to have been kept up at the White House.[19]

PIRACY.—It will be seen by our extracts from the Norfolk papers that the pirates who find shelter in the ports of Cuba, are as daring and blood thirsty as ever, What else can be expected when our executive almost uniformly pardons these merciless freebooters after being convicted on a regular trial? The British, by inforcing the sentences pronounced by their tribunals, have struck terror among the depredators, who, finding that they can plunder and murder our citizens with impunity, now confine their attacks to our commerce, while that of almost every other nation is unmolested. Experience has shown that the naval armament we have in the West Indies is but a feeble protection to our citizens, and can never be depended on so long as our government neglects to adopt efficient measures to compel the Spanish authorities to demolish the nests of pirates, who are not only left to do as they please, but who at all times find a ready market for their plunder in the city of Havana. Can it be believed after the recent arbitrary restrictions imposed on our regular commerce by the governor of Cuba, and the other symptoms of hostility towards our citizens, that the civil authorities of this island are averse to the dreadful scenes that are daily taking place there in open day? How long shall this deplorable state of things be endured? There prevails such a general, and we fear a well grounded, impression, that these wretches find their conduct at least winked at, if not countenanced by the inhabitants and even authorities of Cuba, that it ought immediately to command the attention of the nation, and to become the subject of immediate enquiry in the next Congress.[20]

The government in Washington could not plead ignorance of the situation in Cuban waters at this time for it was fully, vigorously and earnestly informed by its energetic agent in those parts. Surely, if words alone could move, Mr. Randall's protests and appeals should have borne abundant fruit, based as they were on indisputable facts and acts of inhuman atrocity. He writes again to the Secretary of State from Havana, on October 31, 1824:

. . . . Several American vessels were captured about the 20th instant, near Matanzas, by a large launch from Regla, their crews all murdered, with the exception of one seaman, and the vessels burnt. Two of the vessels are known, viz: the *Laura Ann* and the *Morning Star*, both of New York, the latter supposed to have been bound to New Orleans, with passengers.[21] From the first named vessel one seaman escaped, by secreting himself under the cargo, when his companions were murdered. The pirates,

[19] Read, for example, the story of the trial, conviction, sentence and pardon of Jose Perez, *supra*.

[20] NEP, November 15, 1824.

[21] Also N, November 20, 1824.

after setting fire to the vessel, deserted her, when this seaman escaped by swimming to the shore. He reached Matanzas, and has there given a detail of the horrid affair. . . . .

It cannot be endured, that this band of remorseless wretches should be suffered longer to cumber the earth. The robberies and cruelties of the Barbary States, which have so often roused all Christendom to arms, were trifling in extent and ferocity, compared with those of the pirates of Cuba. It is in vain for commercial nations to rely for security upon mere preventive measures at sea, or upon the efforts of the authorities and people of this island to extirpate it. The authorities cannot restrain if they would. Even the present Governor, characterized as he is for firmness and moral courage, feels his power too precarious, at this crisis, to venture upon the measures of rigor and severity essential to its suppression. The ridiculous issue of the late expedition from this port, has only served to display in full relief the weakness of the Government, and to afford another argument of security to the pirates. The unprincipled and wicked have obtained the complete ascendancy, and the honest few dare not denounce or pursue the criminals. In such a state of things, the pirates must be pursued by foreign forces into their retreats on land, and this community coerced by a severe and just retribution to aid in ejecting those miscreants from its bosom.

The temporary cessation of piracies some time before, caused by the presence of a large force on the coast, seems to have induced a delusive and fatal opinion, that the evil was extinguished, and to have led to the diversion of too large a portion of the force, to objects of infinitely less pecuniary, and of scarcely any national importance. I allude to the carrying of specie for our merchants in vessels of war, the whole effect of which is to give a trifling premium of insurance to one class of the community, which would otherwise be paid to another class. In denouncing this practice as detrimental to the best interests of the nation, I but repeat the common sentiment of every man who has witnessed its effects during the past summer. If the benefit to commerce, by this medium, for the transportation of specie, be of sufficient importance, it may be effected by vessels especially designated for that purpose. But experience shows that the suppression of piracy and the transportation of specie, on the late system, are incompatible. . . . .[22]

The official view of the situation is contained in the annual report of the Secretary of the Navy, dated December 1, which is adopted and reiterated with emphasis by the President in his message to Congress of December 7. The former states:

There are few, if any, piratical vessels of a large size in the neighborhood of Cuba, and none are now seen at a distance from the land; but the pirates conceal themselves, with their boats, in small creeks, bays, and inlets, and finding vessels becalmed, or in a defenceless situation, assail and destroy them. When discovered, they readily and safely retreat into the country, where our forces cannot follow, and, by the plunder which they

[22] FR, V, 496.

have obtained, and which they sell at prices low and tempting to the population, and by the apprehensions which they are able to create in those who would otherwise give information, they remain secure, and mingle, at pleasure, in the business of the town, and transactions of society, and acquire all the information necessary to accomplish their purposes. Against such a system, no naval force, within the control of this department, can afford complete security, unless aided by the cordial, unwavering, and energetic co-operation of the local governments; a co-operation which would render their lurking places on land unsafe, and make punishment the certain consequence of detection. Unless this co-operation be obtained, additional means ought to be entrusted to the Executive, to be used in such manner as experience may dictate.[32]

The President's words on this same subject are:

The force employed in the Gulf of Mexico, and in the neighbouring seas, for the suppression of piracy, has likewise been preserved essentially in the state in which it was during the last year. A persevering effort has been made for the accomplishment of that object, and much protection has thereby been afforded to our commerce; but still the practice is far from being suppressed. From every view which has been taken on the subject, it is thought that it will be necessary rather to augment than to diminish our force in that quarter. There is reason to believe that the piracies now complained of, are committed by bands of robbers who inhabit the land, and who, by preserving good intelligence with the towns, and seizing favourable opportunities, rush forth and fall on unprotected merchant vessels, of which they make an easy prey. The pillage thus taken, they carry to their lurking places and dispose of afterwards, at prices tending to seduce the neighbouring population. The combination is understood to be of great extent, and is the more to be deprecated, because the crime of piracy is often attended with the murder of the crews, these robbers knowing if they survived, their lurking places would be exposed and they be caught and punished. That this atrocious practice should be carried to such extent, is cause of equal surprise and regret. It is presumed that it must be attributed to the relaxed and feeble state of the local governments, since it was doubted, from the high character of the governor of Cuba, who is well known and much respected here, that if he had the power he would promptly suppress it. Whether these robbers should be pursued on the land, the local authorities be made responsible for these atrocities, or any other measure be resorted to, to suppress them, is submitted to the consideration of Congress.[33]

The executive and legislative departments of the government were now so deeply interested in the subject as to confer upon ways and means. The following was addressed by the Secretary of the Navy to the Honorable Benjamin W. Crowinshield, Chairman of the Naval Committee in the House of Representatives:

[32] ASP, I, 1004.
[33] Monroe's Eighth Annual Message, December 7, 1824.

NAVY DEPARTMENT,
December 21st, 1824.

Sir: I have the honor to acknowledge the receipt of your letter of the 14th inst. making certain inquiries respecting the suppression of piracy, to which I submit the following answer. . . . .

There have lately been very few, if any, vessels of a large size, engaged in piratical depredations, at a distance from the land. The naval force which has been employed, and which is stated in the report referred to, has succeeded in driving away, or destroying, vessels of that description, and has thus effected the immediate object for which it was created. But the evil has assumed another shape, for which this force does not seem to be well fitted. Our vessels, even the smallest, cannot follow the pirates into many of the creeks and inlets to which they resort—this must always be done in boats, which cannot be carried by them in sufficient numbers to be effectual; nor can the greater part of them, on account of their size, and the want of accommodations for water and stores, remain long at sea, so as permanently and effectually to watch even the most suspected places.

I would therefore respectfully recommend three or more frigates, or sloops of war, as an addition to the forces now in the West Indies and Gulf of Mexico, or as a substitute for the small vessels. The sloops would be as competent to the object as the frigates, and would be much less expensive. We cannot, however, detatch that, or even a less number, from the stations where they now are, without weakening our squadrons too much.

It will be necessary to build them, which can be done in less time, and at less expense, than would require to repair and fit for sea the same number of frigates. Two, or perhaps three, might be finished in four or five months. These vessels would be able to lie or cruise steadily, and for long periods where their presence was most needed; and, being well provided with boats, could pursue into any waters where escape was attempted.

In addition to this provision, our officers should be authorized to pursue the pirates wherever they may fly. The authority which has heretofore been given on this point, will be seen by the extracts from the orders to Com. Porter,[25] . . . . The right to follow should be extended to the settled as well as the unsettled parts of the Islands; and, should this prove ineffectual, a resort will be necessary to such a general and rigorous blockade, as will make both the local Governments and their subjects feel that their interest, as well as their honor, requires a respect for our rights, and the rights of humanity. For such an extremity, the proposed sloops of war will be indispenable. . . . .[26]

The shipping community, naturally exasperated by the continuance of piratical acts, gave expression to its sentiments in memorials to Congress. Very outspoken, if possibly somewhat exaggerating the facts, as recited in general terms, were the merchants of Portland, Maine.

[25] *Vide supra.*
[26] ASP, II, 183.

Piracies on the Commerce of the United States in the West Indies, communicated to the House of Representatives December 16th, 1824.

To the honorable the Senate and the honorable the House of Representatives of the United States of America in Congress assembled:

The subscribers, a committee selected for the purpose by the merchants of the town of Portland, in the State of Maine, beg leave respectfully to represent, that for many years the trade of Cuba and the other islands and ports in the West India seas has occupied the principal part of the tonnage of this collection district; that of late this trade has been much annoyed by a set of pirates, who have constantly watched every opportunity to commit the most lawless depredations. At first, they were content to plunder and maltreat the crews of our vessels, without proceeding to actual murder. Of late, however, they have not stopped short of the most brutal and inhuman outrages. In some instances whole crews, humble and unoffending, have fallen victims to their barbarous and unrelenting fury.

We are in nowise unmindful of the efforts of our own Government, made with a view to the suppression of these intolerable practices, and we are moreover aware that these efforts have, in some measure, been crowned with success. It can but be observed, nevertheless, that the effect has been, at the same time, to add to the desperation and fury of these freebooters. They seem now to consider themselves as engaged with the people of the United States in a war of extermination as well as of plunder. To this they have been led by motives of revenge, and a hope thereby to avoid the means of detection.

These enemies of the human race are found almost wholly in the vicinity of Spanish territory and Spanish population, and are themselves generally Spaniards, and uniformly come from and fly to Spanish territory for succor and protection; and the goods plundered are unblushingly exposed to sale, not unfrequently, in the most public marts of the Spanish West Indies, and in such a manner and under such circumstances as clearly to evince the connivance, if not of the officers of the Government themselves, certainly of a portion of their citizens. It is not even too much to infer, from what has currently taken place, that a very considerable part of the population of the Spanish islands are concerned, directly or indirectly, in these piratical expeditions; and, furthermore, that if the Spanish authorities are not actually implicated in these atrocities, they are at least overawed by those who are.

Your memorialists would not, without manifest reason, depart from that comity which is ordinarily due from one nation to another, and would not on any occasion entertain jealousies and suspicions without adequate foundation. But such has been the frequency and publicity of these acts of piracy, especially on the coasts of Cuba; so formidable and imposing have been their numbers and their armaments; and so long have they been tolerated there, with scarcely the color of an effort on the part of the Spanish authorities to suppress them, that none but the most infatuated or the most wilfully blind can hope for any voluntary exertions on the part of the Spaniards or their Government to afford redress.

Your memorialists cannot hesitate to believe that the time has arrived when it is incumbent on the United States to assume such an attitude, in rela-

tion to the Government of these islands, as shall induce them to consider that we shall hold them responsible for these hostilities of their own people. Have we not already made Spain responsible for spoliations committed upon our commerce in those very seas? And do we not hold all nations answerable for the acts of their people?

It will be replied, perhaps, that Spain constantly disavows and disapproves of these lawless acts; that she professes to abhor piracy, and considers pirates as outlaws, and as her enemies, as well as the enemies of the human race. If so, let her acts correspond with her professions, and sincerity will be accorded to her. Till then, and while she continues a forbearance nothing short in its effect of direct encouragement, we must and ought to hold her identified with the pirates themselves, and answerable for their depredations.

The trade from this part of the country to the West Indies is carried on almost wholly by the shipment of lumber, great portions of which are necessarily carried on deck, perhaps to the amount of one-third, at least. Hence we cannot arm in our defence. And, besides, these lumber cargoes are of small comparative value, and would by no means admit of such an expense. We have, therefore, but one resource: a reliance upon the arm of the Government for protection—a Government, we trust, that will not be duped by empty profession, and that will not with impunity see its peaceful and unoffending citizens wantonly butchered by the desperadoes of any nation.

We do not stop to calculate the value, although inestimable, of our trade to Cuba or to the West Indies. It should suffice that we have a right to a free and uninterrupted navigation of those seas. When whole crews of our fellow-citizens, in the pursuit of a lawful commerce, are seized and unrelentingly butchered, shall we coolly set ourselves down to a calculation of profit and loss before we determine to seek redress? The means are in our power to secure protection to our suffering fellow-citizens, and it is not to be apprehended that we shall be backward in using them.

Your memorialists would respectfully suggest that the class of small cruisers heretofore destined to this service should be increased, and kept constantly upon the alert in those seas, and particularly upon the coasts of Cuba and Porto Rico; and that during the summer and sickly season they should never be allowed to enter any of the ports in that climate but from necessity or in pursuit of pirates; by which means our commerce would be effectually guarded, and the health of our brave seamen effectually secured. Whether a system of convoying can be established in the vicinity of Cuba is also respectfully submitted to the wisdom of Congress. And, as in duty bound, &c.

EZEKIEL WHITMAN,
ASA CLAPP,
ALBERT NEWHALL
WM. SWANN,
CHARLES FOX,
Committee.[21]

PORTLAND, December 9, 1824.

[21] FR, V, 471.

More restrained were the merchants of New York, who contented themselves with modest requests. In December, certain citizens, after reciting their grievances, memorialized Congress to pass a law

> authorizing merchant vessels to arm for their own protection . . . . that the squadron on the Cuban station should be reinforced, that decoy vessels should be employed and that ships of war be furnished with additional launches and boats calculated to pursue the pirates into their retreats and fastnesses.[28]

Moved by these appeals and by a recognition of the necessity for prompt and adequate measures, a bill was introduced in December appropriating $500,000 for the suppression of piracy.

The pirates, being restricted afloat, found scope for their activities on shore. Mr. Francis Adams, Commercial Agent of the United States, writes from Matanzas, to the Secretary of State, under date of December 30, 1824:

> Those piratical bands, who have become the disgrace and scourge of the island, are for the present restrained by the number and vigilance of the forces sent by the United States and Great Britain for their suppression, but that they are only restrained and not extirpated is certain, from the fact that few or none have been captured, and that depredations have recently been committed on land, by bodies of fifteen to twenty persons, by which the foreign settlers on the coast have been the sufferers. Their migratory course of life, and the various points of the coast which afford fine harbors, and are at the same time distant from any military post, or even inhabited districts, renders their extirpation by the authorities of the island difficult, if not impossible; and the arming of merchant vessels to resist the attacks of small boats, and the constant presence of a naval force sufficient to prevent the egress of larger vessels, appears to be the only means of securing our trade from their depredations, until the hopelessness of their employment, or the revival of Spanish commerce, shall have induced an abandonment of their desperate course of life.[29]

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[28] PG, December 13, 1824; FR, V, 428.

[29] FR, V, 589. Communicated to the House of Representatives February 11, 1825, 18C-2S.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

WHAT CAN BE DONE TO IMPROVE ENGINEERING IN OUR NAVY TO-DAY

By Lieutenant (J. G.) V. N. Bieg, U. S. Navy

Engineering in our navy, from the very inception of steam as a motive power, has suffered from the lack of a complete, definite and satisfactory status of its commissioned personnel, and perhaps a review of the vicissitudes and circumstances which have led to the present condition of our engineering establishment will enable us more intelligently to undertake a consideration of the great problem of personnel confronting it now.

It is but a comparatively few years since Congress in 1899 passed the act amalgamating the line and the old engineer corps. The evils attendant upon the old system and the great stride made by this act in the right direction are well known to the majority of officers now in the service, many of whom it directly affected.

Great friction had arisen between the line and the engineer corps, due chiefly to the suddenness with which the service was obliged to adjust itself to the change from sail to steam power as a mode of propulsion. Engineers were for a long period taken into the navy from civil life without military instruction; later, they had two years of instruction at the Naval Academy, and it was a long time before the full four-year course was given. The mutual distrust, the jealousies, the belief of each in the paramount importance of his own particular branch and the sensitiveness of each to any fancied slight of the other led to a condition difficult for us now to conceive. Corps officers of high rank were subject to the orders of line officers much lower in age and experience than themselves, and while it is inconceivable that the young officer in the line in any way took advantage of his prerogative, still this condition of affairs was naturally an irritant. The engineers wished for the bestowal of military titles in recognition of the extreme and growing importance of their duties aboard ship, and so on

and on, *ad infinitum*. These are the most important reasons which were recognized by those having the best interests of the service at heart, as sufficient cause for demanding a change in the conditions then prevailing.

The late Rear Admiral Robley D. Evans was perhaps the pioneer in a search for a better condition of affairs. He it was at all events who first made public the rough draft of a bill, which was firmly backed up by the late Admiral Melville, and which, after being amplified in detail by Captain Sampson, Commander Hemphill, Lieutenant Key, Chief Engineer Rae, Assistant Engineer McFarland, and some others, was at last enacted into law by Congress in 1899.

Now Admiral Melville, largely to whose efforts this radical bill was passed, said at the time that the reconstruction of the personnel hinged upon the provisions made for the future and continuous supply of efficient engineers in the navy; and his intention in working for the adoption of this bill is clearly shown from the following quotation taken from one of his annual reports while engineer-in-chief of the navy:

> My belief in the spirit of the bill was that it contemplated most essentially vast additions to the number of officers who would give earnest attention to engineering matters and in no way aimed to augment the forces available for merely former line of deck duty. . . . . It is only necessary . . . . to look for a moment upon the real requirements, to realize how fundamentally important and distinct are the duties of a mechanical bureau, and also to be convinced of the wisdom of using every exertion to provide the highest special talent for its future operation. . . . . Not only is the trend of modern mechanical work in all branches toward increased specialization, but the wisdom of such a trend is never questioned by the leading talent in the outside world of construction.

From a perusal of the testimony given before the House Committee on Naval Affairs concerning this measure, it would seem that there was a vague impression among the supporters of the bill that those showing special aptitude for engineering would be detailed more or less permanently to its performance, and it must have been realized at the time that there was some danger to the best engineering interests of the navy in doing away altogether with a body of specialists in that branch; for we find in the Secretary of the Navy's report relative to this matter the following:

> The demand for engineer officers, the number of whom has been so greatly decreased by this act, has been met in some measure by the appoint-

ment of 100 warrant machinists who are competent by their service and experience for a certain class of practical work. It is not certain, however, that they can fully take the place of the highly trained technical engineer, upon whom must fall the duty of designing, superintending construction, instructing in engineering branches, as well as supervising the motive power of great ships. The officers of this higher type should, in addition to practical knowledge, be possessed of that thorough theoretical training in steam engineering which comes from full academic education.

It was not long before the absence of some continuous source for recruiting the ranks of the old specialists as they retired, died or took up other than engineering duties, was painfully manifested by the decline in the amount of accurate and constructive data, by the lack of expert opinion on many weighty engineering matters backed by both theory and long experience and by many more vital deficiencies of a like nature. Events soon showed that, though the Amalgamation Act had obliterated the past and had provided wisely for the present, the creation of the warrants had by no means adequately provided for the needs of the engineering personnel in the future.

These very real and urgent needs led eventually to the foundation of a school for advanced engineering instruction which from its first establishment in the Bureau of Steam Engineering in Washington, after many vicissitudes, finally evolved into the present Post-Graduate School at the Naval Academy.

It will be seen from a short discussion of the requirements and duties of the modern engineer why it was inevitable that this should come to pass.

To quote again from Admiral Melville's report:

> Besides this actual bureau work it is necessary to have representatives personally superintend the constructive work and repairs to the machinery of ships at navy yards and stations. The experienced and educated engineer is nowhere more fitly placed than here. They act as skilled doctors for the disabled elements in the naval establishment, and wherever the guardianship of the bureau's interests at such places is left to inefficient hands the results are speedily shown in the character of repairs made. It is in the highest degree economical to have engineering talent of the highest order at the head of the steam engineering departments of these yards, so that ships sent forth from them in apparent cruising fitness may prove most truly so to be.

One has very forcibly brought to mind, at the very beginning of the post-graduate course, what a world of new knowledge is needed over and above that gained at the Academy and through

his years of solely practical experience at handling and operating engines, before he will be in the least degree competent to deal with the great and ever-increasing problems of design. One realizes, too, the great need of the knowledge to be gained at this school by the officer who superintends designing and installation; who must compile or revise specifications; who must censor great numbers of highly complicated blue-prints, and so on. One naturally asks in what condition our Bureau of Steam Engineering would have been at the present time to respond to the enormous engineering problems with which it is confronted, as a result of the new building program just adopted, if there were not still available the guiding advice of experts trained exclusively in engineering branches.

Let us divide this subject into two very convenient heads, strategic and tactical, as it is thought that the terms may be used with propriety, and consider it in further detail.

It is in the immeasurably important strategic field—which here is meant to include everything except operation and management afloat—that the necessity for the specialist is most likely to be felt. In this field naval engineering is outstriding all other professions in its scientific development, and in comparatively late years countless tremendous problems have presented themselves, solutions of which can only be gained by the persistent, conscientious and uninterrupted efforts of a permanent body of men. The end of our best steaming coals is already in sight, our supply of fuel oil is an extremely live and pressing question, and at the present rate of exhaustion the end will come probably within the lives of officers now in the service. A retrogression from oil and liquid fuels to poor coals must surely not be allowed if there is a possibility of prevention. The heavy oil engine still awaits development in this country. On this continent power plants for aircraft have by no means reached a satisfactory state of perfection. There is now a great cry for more and more speed, which adds almost staggering difficulties to the already highly complicated subject of engine design. There are enormous numbers of inventions to be censored. Engineering intelligence reports must be studied and interpreted, and the lessons learned from wars must be incorporated in our engineering establishments. Just as the Spanish war led to the adoption of the water-tube boiler and caused the increase of evaporating plants, etc., so must the present and other wars

seriously influence designing. There is the collection and filing of trial data, the correct interpretation of which means so many thousands of dollars to commercial builders and so much in military power to us. There is the direction of and participation in research work where a thorough knowledge of chemistry, metallography, thermodynamics, etc., is an absolute prerequisite to success; the inspection of material; experimental engineering; the operation and management of large industrial plants ashore; the supervision and organization of repair ships; the supervision of the installation of machinery where the experienced and trained engineer can save so much time, labor and money, and can to so great an extent eliminate the necessity for alterations after commissioning. The old dream of standardization is largely as yet unrealized and although it probably never will be as regards the main propelling plants of large ships, much more remains to be done in the direction of standardizing tool outfits, methods of manufacture ashore, etc. More can be done towards the development of correct, proper and helpful engineering ideals and missions, the development of engineering common sense and judgment, the securing of records of military value toward establishing better standards of work and all the rest of the items that Emerson, Taylor and other efficiency experts tell us are absolutely essential to secure the highest results economically and permanently. All these questions are for the naval specialist.

Can their solution be left to the outside engineering world?

Suppose, for example, the Department had left the development of oil burning exclusively to outside engineers instead of to its own experts and officers of long experience; we all know what the answer would be. Oil burning would still be in the experimental stage instead of having, as now, closely approximated perfection.

The settlement of our problems is up to us; they are unique, distinct and peculiarly our own and must be solved for the most part by us alone, and it is manifest that their solution should be put in the hands of specially trained men.

Our present system is for the most part minus the expert, and the prevailing high opinion of its sufficiency to handle our engineering establishment has been gained because of our intimacy with and highly successful participation in what has been called here *tactical* engineering.

In this we have done marvelously well and will continue to do well; not because of any inherent good in the present system, but because we have been governed and regulated by departmental instructions and pamphlets which constitute probably the greatest and most far-reaching standard-practice instructions ever compiled by an engineering concern the world over. Despite, however, the good results that have been obtained by the operating engineer with academy training only, there has been one thing lacking, not manifest to the engineer who wishes only to get his engineering cruise on his record and then stop. The specialist during this time while possibly producing no higher actual operating results would collect that data, gain that familiarity and experience so vital to future design.

It is believed that in the service afloat the extreme importance of design is not fully realized. Among the younger officers at least there seems to exist a certain contempt for design which in this case has been caused not by familiarity, according to the old saw, but rather because of unfamiliarity with the subject.

It must be clearly borne in mind that the marked military superiority of the oil-fired boiler over the coal; of the turbine over the reciprocator; of forced lubrication over wick feed; of the ash ejector over bucket hoist, and an infinite number of other improvements, hinges on the question of design. All the brains in the universe, all the instructions, all the management of personnel in the world can never make a poorly designed ship as fit militarily in engineering as a well-designed one.

Surely none will gainsay the statement that design belongs to the realm of the specialist. And so we see from the above why it was inevitable that the readoption of the engineering specialist should come to pass. History, reason and experience have all shown us incontrovertibly, irrefutably, that naval engineering cannot get along without the highly trained expert, and that, regardless of all the old arguments to the contrary, he is indispensable, and that he has come again to stay.

If, then, we are to have the specialist, that so many will call a necessary evil, it remains to be determined in what manner he is to be obtained, in what numbers he is needed, in what capacities he is to serve, and in what manner the service at large and he himself in particular may be protected against his narrowness; for it is to be presumed that the specialist is to devote his time to his one

or two subjects and is to attain the highest degree of efficiency in his own line. It is inconceivable that the navy will give up the services of men during the time required to specially educate them and will go to this great extra expense only to have them detailed to some duty not intimately related to their specialty. Although this strange procedure at one time was a fixed policy, it did not last long and has apparently now been abandoned. If our navy is really to protect the honor and integrity of our country then it must conform to an organization which will give birth to the best results and not the greatest number of widely educated officers, who as soon as they become familiar with one subject are for that very reason taken away from it, generally never to return.

Needless to say, however, that the one-sided specialist can do as much harm as good unless there be some directive force to guide the narrowly focussed search-light of his intelligence upon the target we wish to hit.

To get back to the main subject: The Navy Department has stated that at the beginning of 1916 there were needed over 200 post-graduate engineers. At that time there were only in the service about 56, and as the Post-Graduate School is at present turning out only about 16 or 20 marine engineers a year, it is clearly seen that at the present rate engineering will have to suffer for some time to come for lack of the best personnel.

This situation could, it is believed, be best solved in the following manner:

The newly graduated midshipmen, all of whom would have had, as now, engineering instruction at the Academy, in order that the number available for engineering operating duty would not be reduced, and, too, that they might possess that knowledge so necessary for the intelligent operation of other than steam machinery, should be given an intensive six months' tour of deck duty where their qualifications for command could in some measure be marked, and then six months in the engine rooms where their mechanical ability could be observed. At the end of two years of such alternating duties, about 55 of those most suited for engineering should be sent to the present Post-Graduate School, which for this purpose need not be altered in the least. The advantages of starting the course at this early date are, that the services of the men studying are best spared when they are potentially not so valuable as later in their careers, it would not

be so difficult for them to get back to studying again, and less time would have to be devoted to review before the real work began. After completion of this course they should be sent at once to a large ship for six months' or a year's practice and then detailed as engineer officers of destroyers and should remain there until the end of that cruise. It is in the destroyer that the designer must be at his best, where every ounce of extra weight must be eliminated, and where the increasing intricacy and size of the engineering plants demand that the very best talent be secured for successful and economical operation.

The situation in the destroyers is at present acute, not only because it is not possible to get engineer officers of long experience, but by reason of the fact that it is becoming daily more difficult to obtain the subordinate personnel which has had sufficient oil burning and turbine experience. Under the present system of detailing officers to the post-graduate course after they have reached the grade of lieutenant (junior grade), our destroyer engineering establishment will rarely have the benefit of the increased learning of the specialist, nor will the latter always have the valuable training, not only in engineering, but in the dozen and one duties that must fall alike to every officer performing destroyer duty. Required by necessity to perform many duties outside of his specialty the engineer would have the broadening influence of these multifarious other duties, and, as he would have received the same instruction at the Academy as the other officers, he would be entirely qualified for their performance.

There is no intention here to belittle the engineering results obtained in the flotilla to-day, but the point is made that in most cases the experience gained at considerable cost is not perpetuated throughout the engineering establishment by reason of the fact that the present engineers are neither designers nor are they a permanent body.

After the end of this destroyer cruise which would render the engineer familiar with the practical side of deck duties, a matter of the utmost importance, he should alternate on shore and at sea in the usual manner, except that his first cruise should be made to include the time spent ashore for special instruction.

The number of specialists after the present great demand has been satisfied should be regulated by the needs of the service and should be proportioned among the several grades so that there will

be the same percentage of specialists in each rank as in the service at large in order that the same promotion will be provided for. Under the new system of promotion by selection, demand and supply should form a nice balance which, if regulated so that specialization would in some measure guarantee promotion, would form the inducement needed to attract sufficient numbers of officers to take this strenuous course.

The above system would furnish us with officers highly trained in their specialty who had had seagoing experience on destroyers; who would be of the line and of the Naval Academy, used to its ways and discipline; drilled in the handling of men and officers; and, in short, possessed of the greatest number of virtues that a specialist can have. If some such scheme is not adopted soon, then the expedient now resorted to, of admitting college graduates to meet our urgent engineering needs, must continue to be adhered to. This must soon again bring to the front all the old problems confronting the service at the close of the Civil War. These men must be taught all over again; they know nothing of discipline or handling military men; know nothing of the problems of the service; in short, they bring with them the very qualities we have been all these years trying to stamp out. It is true that they would possess a certain amount of marine-engineering knowledge, but it is their deficiencies in other subjects which would preclude their becoming good naval engineering officers, and the history of the past has clearly shown us that the naval engineer, not the steam or marine engineer, is what the service needs.

Although the outside world tends more and more toward specialization of the narrowest kind, it is true that there, as well as in the navy, the best specialist is made from the general practitioner; that is, within reasonable limits and under the system suggested here, enough and quite enough general practice will be had by the post-graduate. If, however, the college man is to be taught naval general practice after his entrance into the service, the beginning of his real service to the navy would begin only after the lapse of three or four years, a greater time than it takes to create the better post-graduate.

It is objected by some that specialization will reduce the number of officers available for fighting the ships. This may have been a good argument years ago, but now when every fighting element of the ship is run by machinery and the power for its operation must

be furnished from below, it is paramount that the leading officers of the engineering department, whether specialists or not, remain below on their stations during action, as segregated from the rest of the ship as if they were capable of nothing else. Furthermore, the rest of the commissioned engineer force, picked as at present from the non-specialists, would still be available for fire control and other duties with the guns. In modern warfare when enough casualties have occurred for it to become necessary for the engineer officer to assume command, then there will be little left but the engine rooms to take command of, and good engineering and high speed would be all that the most sagacious commander could desire.

There seems to be nothing standing in the way of the adoption of the above outlined plan, as we are already specializing on a small scale, and from lieutenant on, exclusive detail to engineering duty has already been provided for by Congress.

Nothing but good can come of it, and as it takes not a whit from the opportunity of the non-specialist to gain the knowledge necessary for intelligent command it can do harm in only one possible way. There is the slight danger of the old corps troubles creeping back. This among academy graduates is slight, but even that small chance can be guarded against, and certainly now that 30 or more college men are to be admitted to the service every year for a period of 10 years, some effective guard against this danger is warranted for their benefit alone.

Let us have one or two officers of long engineering experience always at the War College to keep in touch with the engineering needs of our service as determined by purely military requirements. Then from these military needs a definite engineering mission may be determined; an estimate of the entire engineering situation can be made and constantly kept up to date; and through the medium of these officers, all specialists would be kept continually indoctrinated; engineering effort would be directed into those channels most necessary for the promotion of military good, those necessary for the most efficient and economical administration and elimination of wasteful effort.

We have an engineering mission given us now in our Performance Rule Books, but how can any mission be executed by an ever-shifting and half-interested personnel, whose advancement must depend upon the violent disturbances and fluctuations produced by occasional outcroppings of invidiual genius.

Let us have and have soon a permanent, devoted, highly specialized engineering body, trained to seagoing in its youth; dominated and impregnated with military ideals and doctrine; let us give them as now military rank and authority, the same privileges and emoluments as now; let us give them a mission evolved from a deep and exhaustive study of engineering history from its very foundation, its past, present and probable future developments; give them War College guidance, the directive force of whose teachings can never be questioned by those who have studied them: give all this and a mission ever pointing to the target to be smashed, and the narrowness of the specialist becomes not something to be feared but a virtue comparable to the straightness of the bore of a gun in its guidance of a shell toward its object.

Man has been throughout the annals of time a creature of *mission,* and few indeed are the cases where, given a superlative ideal, he has not given up his comforts, his home, his life if need be and those of thousands of his fellow men. Given a mission, von Moltke waded through France sacrificing thousands of innocent lives; Napoleon, without hesitation, deluged Europe in blood: hundreds of men have given the prime of their lives, have suffered untold tortures, only to reach a fruitless and barren ice field; hundreds of thousands of men to-day at a mere word leap from their trenches to tear across *no man's land,* their ranks decimated by every hellish destructive contrivance devised by the ingenious brain of man, yet they go, drawn on and on, to death or the fulfillment of their mission as a powerful magnet would draw so many iron filings.

Can there be any danger that the highly educated naval officer will fail to follow the lead of his War College direction?

Decidedly not; if it is made an integral part of his special training, as indeed it should form part of the compulsory training of every officer from his youth up. We should make use of specialization together with this War College instruction for the furtherance of our engineering as soon as it is humanly possible to do so. There is positively no excuse for our not having the finest naval engineers in the world, and, too, we are coming to a period when we will be up against the keenest competition; we are to compete against veteran navies developed almost to superhuman perfection under the tremendous stimulus of the present war. We are a great organization right now, potentially at war

with any one of these foreign navies, and we must not only hold our own with them, but we must put on high gear and full speed and lead. To accomplish this there is no time to lose; already the horsepower of foreign ships, built and operating, has reached the 180,000 mark. We ourselves have projected ships of as great or even greater power, and the end is nowhere in sight. Engineering is advancing by leaps and bounds with every breath we draw.

Under our present system if we continue to dally along in our complacent inefficiency we will surely fall behind in the race.

Are we to do this or will we give proper opportunity and efficient direction to our American mechanical genius that it may secure for us what we have every right to demand of it, a leading place in the world?

U. S. NAVAL INSTITUTE

SECRETARY'S NOTES

To Members

Several months ago we published a general appeal to members, asking for a concerted effort to build up the membership of the Institute. The response was not unanimous by any means. The *only direct reply* received, however, illustrates the ease with which the membership can be built up to include practically every officer of the service —line, staff, marine, warrant. In that case an officer nominated many members from one ship and related that it only seemed necessary to call the attention of officers to the fact that they were not members, collect their checks—they "had all intended to join some day but somehow had put it off"—and send in the names. He suggested further that the Secretary adopt his method. As a matter of fact the method suggested has always been in use by the Secretary, one result being that the majority of all classes at the Naval Academy become members as well as practically every member of the graduating classes. The method is not so successful with the service at large because it has been impossible for the Secretary to find the right man on each ship and station to take this matter up. Letters by the thousand are just "advertising letters" and the mimeograph has gained us very few active friends. However if YOU, individually, will take an interest in this effort or if YOU will call attention of *the officer* you think may be most willing to interest himself in the Institute's welfare, there is no doubt the result will be very much worth while. Gather in the non-members of the line, the staff, the marine and the warrant grades and call the attention of the new reserve officers to the benefits of membership. Ask the division officers to inform their men that subscriptions of enlisted men bring the same benefits at the same cost as membership does for officers. Read again the paragraphs on "Growth and Support" in the January, 1917, PROCEEDINGS, which cover the subject and need not be repeated here.

Steps in Development

(a) Sale of Institute publications on all orders of 10 or more copies of the same publication or on orders amounting to $10 for the benefit of enlisted men or service training organizations at minimum rates.

(b) Subscriptions to the INSTITUTE PROCEEDINGS to enlisted men at $2 per year.

(c) Establishment of the "Book Department" for the benefit of members and subscribers; Professional Book List.

(d) Information Bureau.

(e) Maintenance in revision of all Institute publications.

Book Announcement

Bullard's Naval Electricians' Text-book; revised and rewritten by officers of the Department of Electrical Engineering, U. S. Naval Academy; will be ready for distribution as follows:

Volume I, about September 1, 1917.

Volume II, July 15, 1917.

The Watch Officer's Manual by the late Ensign C. E. Hovey, U. S. N., is undergoing revision and will be ready for distribution about August 1. This book has been completely revised and rewritten and will be issued in improved form, greatly enlarged.

A Manual of International Law, for the use of naval officers (revised, 1917), by Rear Admiral C. H. Stockton, U. S. N., retired. Publication has been completed and the Manual is now available.

Naval Construction, by Naval Constructor R. H. M. Robinson, U. S. N., is now undergoing revision and a new edition will be published about September 1, 1917.

Suggestions Invited

Comment and suggestions relative to the make-up of the PROCEEDINGS are invited from all members interested in the welfare of the Institute. It is believed that the scope of usefulness of the PROCEEDINGS to members can be increased and all members are invited to assist in this work. Should any topic, on which you think an article could well be written, occur to you, send it to the Secretary and Treasurer, together with such explanation or comment as may appear desirable in order that the intent of the suggestion may be clearly understood. The Institute is desirous of obtaining good

"sea yarns" for publication. It is hoped that any one who can spin such a yarn will submit it.

Membership Since May 16, 1917, 62 regular and 10 associate members have joined the Institute.

Death: Lieutenant K. Heron, U. S. N., June 1, 1917.

Amendments to Constitution *Members are urged to send in their ballots on the proposed changes in the Constitution of the Institute.* As explained in the memorandum issued by the Board of Control, no action can be taken unless a *majority* of the members send in their ballots. To date about 45 per cent of the members have done so.

Book Department The Institute Book Department will supply any obtainable book, of any kind, at retail price, postage prepaid. The trouble saved the purchaser through having one source of supply for all books, should be considered. The cost will not be greater and sometimes less than when obtained from dealers. Bills will be rendered upon delivery of books.

Illustrations Authors of articles submitted are urged to furnish with their manuscript any illustrations they may have in their possession for such articles. The Institute will gladly co-operate in obtaining such illustrations as may be suggested by authors.

Original photographs of objects and events which may be of interest to our readers are also desired, and members who have opportunities to obtain such photographs are requested to secure them for the Institute.

Annual Dues The annual dues for 1917 became payable on January 1, 1917. It is suggested that dues be paid in lump sums covering a period of two to five years; this method of payment has advantages for members as well as for the Institute and is practiced by a number of members, both regular and associate. Response to this notice will save the Institute a considerable sum in stationery and postage.

Notice

Whole Nos. 145, 146, 147, 149, 155 and 166 of the PROCEEDINGS (March, 1913, June, 1913, September, 1913, January-February, 1914, January-February, 1915, and November-December, 1916) are exhausted; there are so many calls for single copies of these numbers that the Institute offers to pay for copies thereof returned in good condition at the rate of 25 cents per copy.

Address of Members

All members are urged to keep the Secretary and Treasurer informed of the address to which PROCEEDINGS *are to be sent, and thus insure their receipt.*

This precaution is now of particular importance as notices of changes of station are not now available for the use of the Institute's staff.

Non-receipt of Proceedings

Members and subscribers are urged to notify the Secretary and Treasurer promptly of the non-receipt of PROCEEDINGS, in order that tracers may be started. The issue is completed by the 10th of each month.

Reprints of Articles

The attention of authors of articles is called to the fact that the cost to them of reprints other than the usual number furnished, can be greatly reduced if the reprints are struck off while the article is in press. They are requested to notify the Secretary and Treasurer of the number of reprints desired when the article is submitted. Twenty copies of reprints are furnished authors free of charge.

ANNAPOLIS, MD., June 16, 1917.

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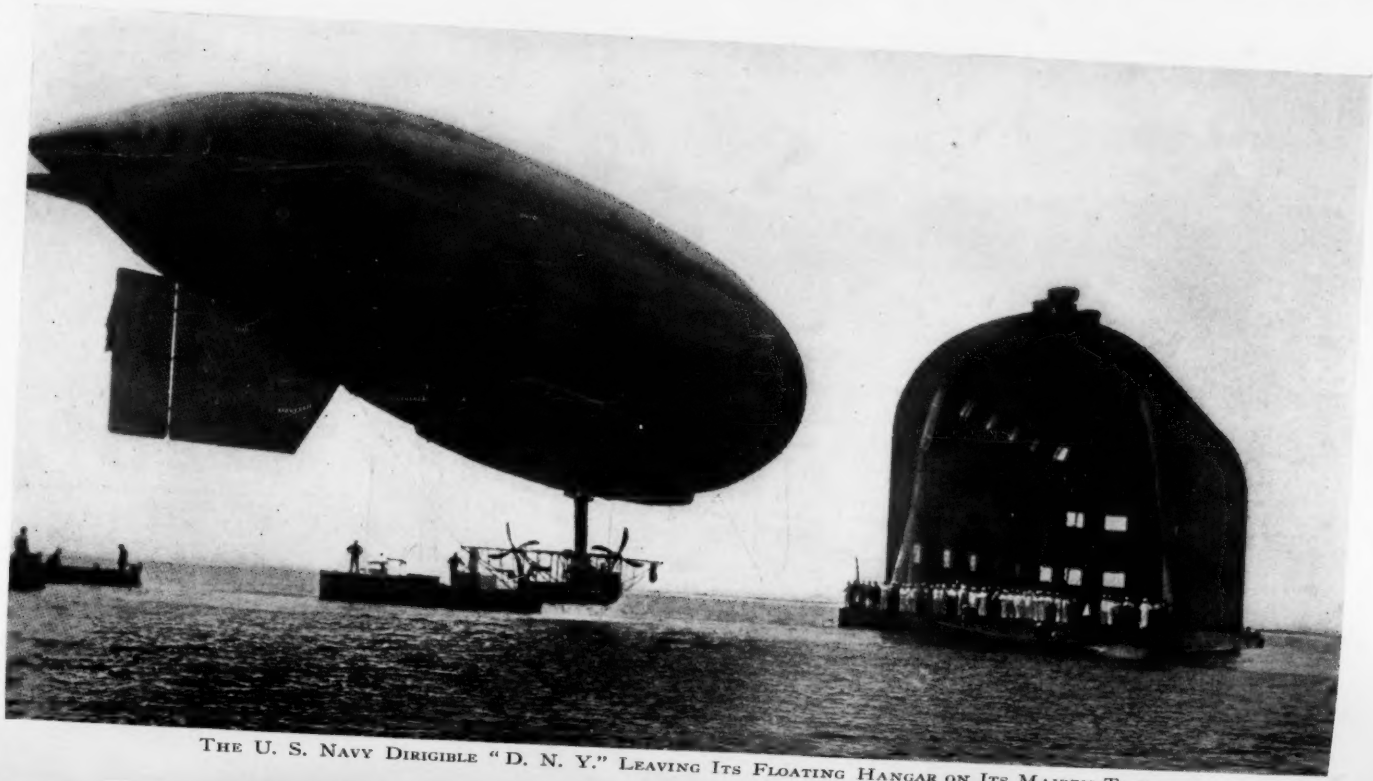

THE U. S. NAVY DIRIGIBLE "D. N. Y." LEAVING ITS FLOATING HANGAR ON ITS MAIDEN TRIP

THE U. S. NAVY DIRIGIBLE "D. N. Y." LEAVING ITS FLOATING HANGAR ON ITS MAIDEN TRIP

PROFESSIONAL NOTES

Prepared by LIEUTENANT I. C. KIDD, U. S. Navy

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NOTE.—Ship construction in the nations at war is held confidential and no reliable information is available.

ARGENTINA

COAL.—According to information from Buenos Aires, Argentina is to import a trial cargo of 5000 tons of Chilean coal, to be used in vessels of the navy. This coal is much softer than English and American coal, and it is considered doubtful whether it will be suitable for burning in the furnaces of Argentine vessels.—*Shipping Illustrated*, 2/6.

BRAZIL

FORTY-SIX GERMAN SHIPS TAKEN OVER.—President Braz, June 2, signed a decree providing for the utilization by Brazil of the German ships in Brazilian ports.

The taking over of the German ships was being put into effect June 2, the crews being interned on Fleuris Island. Brazilian crews have gone aboard the German vessels.

Senator Azevedo has submitted a measure authorizing the government to take measures to render efficacious the military and naval power of Brazil. The measure also provides for the necessary credit operations to realize this object.

Forty-six German merchant ships were laid up in Brazilian ports early in the war. The vessels aggregate 240,779 tons, of which the largest is the Hamburg-American liner *Bluecher*, of 12,500 tons. Thirty-three of the vessels are of more than 4000 tons each.—*Washington Post*, 3/6.

BRAZIL DEFENDS SEIZURE OF SHIPS.—An *Associated Press* despatch dated June 6, from Rio Janeiro says:

Brazil has replied to the German note protesting against the requisitioning of German ships with a declaration that the republic has acted within the strict limits of the law, even as interpreted by Germany. The Brazilian reply says, in part:

"The utilization of German ships by Brazil follows the torpedoing of Brazilian merchant ships and assures, directly and immediately, although by force, satisfaction to the losses caused by German submarines. Brazil is acting lawfully and on the basis of even German law. It has taken a step which all nations take, even without abandoning its state of peace, for the sole reason of forcing an offending nation to make due reparation."

The reply then quotes the opinion of the German authority on international law, Herr Heffter, and concludes:

"The government of the republic does not depart from the calm region of the principles of those laws which have previously governed international society, and proceeds solely in defence of the flag and interests of its country."

The Dutch minister presented to the foreign office the note from the German foreign secretary protesting against the utilizing of German ships.

The note follows:

"I have the honor, in the name of the Imperial German Government to formally protest to the government of the United States of Brazil against the requisition and utilization of German ships anchored in the ports of the republic. I reserve to myself the right to demand an indemnity for all losses occasioned to German interests by such a measure."—*Washington Star*, 6/6.

CUBA

The Cuban cruiser *Patria* and the Cuban gunboat *Baire* have arrived at a navy yard in the United States to be extensively refitted to aid in an aggressive patrol of the West Indies against German submarines and commerce raiders. In addition to extensive overhauling, these vessels will get new armament throughout, all their new ordnance being of the same character as that in the United States Navy, for ships of similar tonnage and character.—*Army and Navy Journal*, 26/5.

GERMANY

RESOURCES.—Back of the protest of Great Britain that the German U-boat warfare is barbarous and piratical lies a deep fear of that terrible weapon which threatens the very existence of all island empires. The popular belief is that the bitterness of the world struggle is for the preservation of democracy, but a study of the map of Europe and the resources of the territory that Germany now holds gives an added light to the present stage of the war, no matter what its initiative may have been. When the oil fields of Roumania fell into the hands of the Germans, they received a trump card that they will never give up; as compared to it all other conquests are as nothing.

This resource together with the invention of the Diesel engine, the product of a Bavarian engineer, is the tangible thing that must be fought if Germany is to be conquered. Its importance may be gathered from the fact that the Diesel engine reduces the consumption of fuel per unit output to less than one-fifth of the quantity of fuel consumed in steam engines and boilers for the same output.

The evident great saving in fuel, while it is important, is a small item in comparison to the increased radius and cargo-carrying space that a Diesel engine equipped vessel has over a steam engine equipped craft. The German Navy has not limited the use of oil power to submarines, but has applied it to the propulsion of destroyers, cruisers and light battleships, giving such craft an almost unlimited radius of action, which means that the modern war vessel of the future must be capable of making a non-stop voyage around the world if necessary. Germany possesses, moreover an improvement on the Diesel in what is known as the Junker's oil engine which by using opposed pistons and valves enables an output of 1000 horsepower per cylinder, or 45,000 horsepower per shaft, enabling the application of oil power on the largest scale, and also permits horizontal engine construction, an advantage in the propulsion of war vessels so great that we have not space to enumerate one-tenth of its value.

Quite a number of good people in the United States seem to think that calling Germany hard names will help to win the war. A much wiser method, it seems, would be to study her resources and try to defeat her along those lines. If our daily press devoted more space to acquainting the public with Germany's real strength instead of villifying our enemy, it would gain much more hearty and unanimous support for the struggle that is before us.—*Marine Journal*, 9/6.

DENY MUNITIONS SHORTAGE.—The Kaiser's army is in no danger of running short of munitions, says a semi-official statement recently furnished to the German press in answer to alleged "efforts of the English press to spread the rumor that Germany has a shortage of the most important raw materials for the production of high explosives," and quoted in London newspapers.

It is asserted that the manufacture of gunpowder and explosives in any quantity has been made certain, and Germany is said to be producing by artificial means larger quantities of nitrogen than she imported from Chile before the war. The place of cotton in the manufacture of powder has been taken by cellulose. There is now abundance of glycerine, since Germany has succeeded in producing it not from fats, but from other materials of which there is an unlimited supply. It is said that for a long time Germany has been in this respect independent of foreign supplies, and it is added:

"In these circumstances not only has it been possible continually to increase the production of powder and explosives up to the present, but Germany at the present moment has reached a stage when production is being increased to an extraordinary extent, and this expansion can be continued as far as we please."—*N. Y. Herald*, 3/6.

HARDSHIPS ABOARD SUBMARINES.—Under the tile, "The Hardships of the U-Boat Service," Captain L. Persius, the leading German naval writer, contributed the following article to a recent issue of the *Berliner Tageblatt*:

"At present the crews of the German submarines are the objects of particularly warm interest.

"Of course, their heroic activities have been followed with undiminished attention ever since that notable 22d of September, 1914, when the never-to-be-forgotten Weddigen sent three English armored cruisers to the bottom of the North Sea with well-aimed torpedoes from the *U-9*. That the 'David,' the little submarine, is able to give the death blow to the huge 'Goliath,' the battleship, and that it possesses powers far exceeding the

expectations placed upon this most modern instrument of battle before the war, has been proved by the torpedoing of the ships of the line before the Dardanelles, which put an end to the entire Anglo-French undertaking, in particular, and furthermore by the sinking of many other enemy warships.

"But the U-boats have made themselves the center of attraction only since they have shown their effectiveness in the warfare on commerce. Here an entirely new field was opened to them. On October 26, 1914, the British merchantman *Glitra* fell a victim to a U-boat (*U-17*) southwest of Skudenaes on the Norwegian coast. This was the first destruction of a merchant ship by a submarine. Soon others followed on the Atlantic coast of France, in the Irish Channel, etc. The world stared in surprise. The U-boats were attacking the enemy's commerce. That was a novelty never anticipated. During the two and a half years that have passed the feeling of certitude has grown more definite from month to month that the U-boat may be destined to cut off the main artery even of Great Britain that rules the seas, through the tying up of her imports, and that thus the U-boat points to the way in which the 'freedom of the seas' may be insured in the future.

"If the people whose existence is most closely connected with the uninterrupted importation of foodstuffs from over the sea sees that for its own life it must move for the undisturbed peaceful use of the seas even in war times, then the last barrier will fall, *i. e.*, all the paragraphs contrary to civilization, those speaking of prizes, privateering, contraband, must be removed from sea law; in short, the principle that ought to be taken for granted by civilized nations that private property may not be destroyed on the water, as it may not be infringed upon on land in time of war, will be recognized.

"*Praise of Submarine Crews.*—The men who are helping create this condition desired in the interests of humanity and the development of culture are the crews of the U-boats. Of course, in order to carry out their task, they need instruments, vessels, and weapons of the most cunning construction. The creators of these things, the shipbuilders and engineers, must not be forgotten when the triumphs of the submarine weapon are brought to mind. Only after the war will it be recognized to its full extent what the German people owes to its U-boat builders and to the constructors of the many pieces of machinery concealed in the U-boats, and what almost incredible technical progress has been made in Germany since the fall of 1914, not only in the perfection of projects, but also in the rapidity with which the desires of the front have been fulfilled. Any one who might be permitted to raise the curtain just a little and to penetrate the veil that now naturally covers everything connected with U-boat construction would be overwhelmed with the extent of what has been created by German science in every necessary line.

"But the most excellent weapon is of no use by itself. It must be placed in the hands of men who know how to handle it. In fact, the capability of the modern U-boat, born in German shipyards, is unlimited. But the capability of the U-boat personnel is also unlimited. Germany witnesses the successes of the U-boats almost daily. We all read about the daring deeds of the U-boats. So no doubt everybody has formed a picture of the life of the brave fellows upon whom the hopes of Germany are now built. Certainly, this picture will resemble the reality in but few cases. But that doesn't hurt the matter any. Admiration for the U-boat men will always form the background, and the U-boat men deserve this admiration to the highest degree.

"A seaman's lot is never easy. Night and day he is separated from a watery grave only by a thin plank. And yet his existence seems like paradise compared with that of the U-boat man. This man dispenses with what every child of man regards as indispensable for life—light and air. When the road to hades gapes for the U-boat man it leads through darkness and torment. He knows that he is threatened most by a slow death

through suffocation. Everybody else—with exceptions like stokers, men in the magazines, and some others—enjoys the fresh air and looks up and sees above him the broad canopy of heaven when in the roar of the battle he must enter the gates of the Great Beyond. Indeed, in every case, 'Dulce et decorum est pro patria mori.' But our sympathies will be more deeply moved when we think of the death of the U-boat man.

"*Life on a U-boat.*—Of course the U-boat man also sees some of the bright side of life, and it would be wrong to pass by without noting this. On board a big battleship the individual is more or less lost in the crowd. He is only one among the more than 1100 men composing the crew of a modern ship of the line. On board the U-boat every one is an important personality. There are rarely more than 30 men in a high seas U-boat. So every one, be he sailor or oiler, has several duties to perform; so every one is fully acquainted with all the numerous mechanisms and expert in their use. The commander, watch officer, and chief engineer know every one of their men thoroughly. They stand in a comradely relationship to them, they share their sufferings and joys in every way. Their food is all cooked in the same kettle and gift cigarettes of the same brand are found between their lips when the boat bobs up for a brief rest and the weather permits. Below decks smoking is not allowed. To be sure, the commander has a tiny little room of his own—in which to write his official reports, etc.

"But the lack of light and air, the absence of every comfort, the dangers that constantly menace them every hour, yes, every minute, are the common lot of all U-boat men. There is, however, greater responsibility upon the officers and the chief engineers, although every single U-boat man, sailor and oiler alike, knows that oftentimes a slight oversight or a false move will seal the fate of himself and his comrades.

"The most careful selection among the volunteers, who are always offering themselves in great numbers for the U-boat service, is just as important as the long period of training during which the U-boat aspirants are schooled in every branch of their difficult service. They must all be in superior health and be what they call 'fixe Kerle,' *i. e.*, quick in perception and decision, never timid or hesitating, skilled, and also infinitely serious in their conception of duty, dependable and steadfast. The sailor must be a 'thoroughbred seaman'; the oiler a perfect mechanic.

"The members of the crews are trained at the U-boat school. There they become acquainted with all the many complicated apparatus, the expert use of which forms the basis for every success. The pupils are made familiar with the instruments that show the condition of the atmosphere, the trim of the boat and the height and depth, with the functions of the numerous valves, slides and levers, etc., and with the safety and life-saving apparatus, a thorough knowledge of which is indispensable for every U-boat man. In addition to these general points, the U-boat sailor must, besides his ordinary qualities of seamanship, have skill in navigation, in signaling, in serving and launching torpedoes, and in handling the deck guns and their ammunition, while the oiler must understand the care of the engines that drive the U-boat above and below the water well enough to enable him, in case of necessity, to take the place of the engineers and, if possible, that of the chief engineer.

"Correspondingly greater demands are made upon the officers and the engineers. Every U-boat commander is almost a 'superman.' He must possess extraordinary gifts of both an intellectual and physical kind if he wants to fill his post with success. To him belongs a quite special talent. The officers' corps of the German Navy includes a number of such 'supermen.' These U-boat commanders are reinforced by an excellent body of engineers, whose loyalty and knowledge already in times of peace had more than once demanded unlimited recognition.

"The U-boat commander and chief engineer, manager of the boat and commander of the weapons on board and manager of the engines—that is, the forces that give life to the boat—are supported by a personnel of

sailors and oilers capable and filled with the joy of service. They all blend in a whole that firmly binds them 'a row of brothers' in danger and distress, and that, if a pitiless fate so decides, maintains its firmness in loyal comradeship in death itself."—*N. Y. Herald*, 3/6.

GERMAN CASUALTIES.—The following are the German casualties reported in official German lists up to the end of April, including the losses of all German nationalities, but not including naval or colonial casualties. The totals from the beginning of the war until the end of last month (including corrections made during the month) are also shown:

	April 1917	Total
Killed and died of wounds	8,297	975,373
Died of sickness	2,682	66,656
Prisoners	533	293,282
Missing	3,775	240,610
Severely wounded	6,576	558,269
Wounded	3,168	307,295
Slightly wounded	13,620	1,563,973
Wounded remaining with units	4,187	240,346
	42,838	4,245,804

It should be noted that the figures do not constitute an estimate by the British authorities, but merely represent the casualties announced in German official lists. It should also be noted that the casualties are those reported during the month of April—not reported as having been incurred in April.—*The Army and Navy Gazette*, 26/5.

THE "DEUTSCHLAND."—The commercial submarine *Deutschland*, according to a Berlin official report, is now lying in a German harbor. The reason of the issue of this report is stated to have been through the exhibition of a film in Switzerland showing the *Deutschland* being brought into port by two French cruisers.—*The Army and Navy Gazette*, 26/5.

GREAT BRITAIN

THE ANTI-SUBMARINE DIVISION.—Answering Sir H. Norman on May 2 in Parliament, Sir Edward Carson said: The Anti-Submarine Division, the establishment which was announced in the First Lord's statement on February 21, is the body charged, under the Board of Admiralty, with the technical study of methods of anti-submarine warfare, as well as with the duty of advising actual anti-submarine operations. The function of the Board of Invention and Research was, and still is, to investigate definite problems or to undertake general research work agreed upon as likely to lead to valuable results, in anti-submarine warfare as well as other naval activities. The director of the Anti-Submarine Division is a rear admiral, who previously held a flag appointment in the grand fleet. He is assisted by a staff of younger officers selected from the service afloat for this particular work.—*Army and Navy Gazette*, 12/5.

ADMIRALTY TRAWLERS.—Dr. Macnamara, replying to Sir Archibald Williamson, said that the trawlers and drifters on order for the Admiralty were of similar design to those generally in use for fishing, and their preparation for war service was made with due regard to rapid reversion to peace pursuits and with the idea of reinstating losses in the fishing fleet. Mine sweepers naturally had to be designed primarily for mine-sweeping purposes, and their adaptation to peace pursuits would not be so easily executed.—*The Army and Navy Gazette*, 12/5.

ADMIRALTY AND SHIPBUILDING.—Sir E. Carson, replying to Mr. Pringle in Parliament on May 2, said: In May, 1916, the possibility of releasing firms for merchant shipbuilding was considered by the Admiralty, and as a result 13 shipbuilding firms and eight marine engineering firms were surrendered at the beginning of June, 1916.—*The Army and Navy Gazette*, 12/5.

THE NAVAL CRISIS.—The following article by Mr. Arthur Pollen appeared in *Land and Water*, May 10:

"For the fourth time since the beginning of hostilities, both the constitution and the personnel of the higher command of the British fleet are now in dispute. This is a crisis on the right ultimate solution of which the progress of the war and hence the attainment of the object we have in view must, to a very great extent, depend. I say *ultimate* and not immediate, because the problem is highly complicated, men are about to be tried in new duties, and many of the issues are very obscure. It is far from likely, therefore, that we shall rest content with whatever reforms and changes are made in the present emergency.

"It is unofficially asserted that the Prime Minister and the First Lord of the Admiralty have been jointly occupied in giving their personal attention to the reorganization of Whitehall, that extensive alterations of the system are to be carried out, and that considerable and important changes are to be made by putting officers, now at sea, either into new posts to be created, or into posts now occupied, where fresh experience and a new outlook are needed. It is also stated that these impending changes will put everything right and secure the carrying out of a more vigorous and effective naval policy. So momentous are the issues that it is devoutly to be hoped that the expectation raised for us by these anonymous communications may be realized. But we do not know either the general character or any details of the proposed reforms, so that no criticism of them is now possible. They may be communicated to the public before these lines appear. It may be they will be communicated first to the House of Commons at the secret session which is to take place on the day of publication of this article. Perhaps, therefore, the only useful thing one can do is to sketch, very briefly, the sequence of events that has led to the present situation.

"On the 19th of last month (April), when I wrote the last article of mine that has appeared in this journal —*Land and Water*—the enemy's submarine campaign had persisted for over 10 weeks at a very disconcerting level of efficiency. There were slight variations from week to week, but over the whole period we had been losing ships at an average of 24 a week, while 14 more were the subjects of unsuccessful attack. We were not informed either of the total tonnage that was lost, or of the number of ships that were injured without being sunk, nor yet of the losses incurred by neutral shipping—so that we were entirely uninformed as to the *net* deduction from our carrying power. It was not indeed until last week that the figures, given by the *Aftenpost*, of the Norwegian losses were published in this country. From this it appeared that during March and April this single neutral had lost 66 in the first and 70 ships in the second month. On the average, then, Norway was losing 17 ships a week. If the ratio of unsuccessful attacks on Norwegian ships was the same as on British, there may have been 12 or 13 weekly. Thus, in addition to the 38 weekly attacks on British ships, there would be 30 on Norwegian, giving an aggregate of over nine a day. This takes no account either of Allied ships or of those belonging to other neutrals. The situation, then, on April 19, even without knowledge as to neutrals, was clearly serious. That the effectiveness of the enemy campaign had been multiplied at least by three since November 30, when the present Board of Admiralty was appointed, seemed to justify me in the opinion I then expressed in the following words:

"'The chiefs of the greatest navy in the world have simply failed in so crucial, yet elementary, a duty as protecting the sea-borne commerce of a sea-girt people.'

"I then went on to state that we had followed a wrong principle in changing the personnel of our chief command on three occasions during the war, without in any way bringing the system of Admiralty administration into closer harmony with the principles that ought to underline the constitution of any authority engaged in the direction of fighting forces.

"In our next issue—that of April 26—there appeared a contribution from 'Flag-Officer,' the writer of which, after expressing a general endorsement of the opinions expressed by me, both in the article I have just quoted and in the contributions to these pages during the last few months, went on to elaborate the theory that, unless the military direction of the fleet in war, and the training and preparing of it for war, were completely divorced from the civil administration, it was quite impossible that those fighting objectives for which the fleet is brought into being could be obtained. Simultaneously with the publication of this letter, it was announced that the rate of destruction of British ships had doubled in the preceding week. Whatever justification there was, therefore, for saying on April 19 that our higher command had failed, was greatly reinforced when it was known that such far graver results had followed from it. It is not surprising, therefore, that 'Flag Officer's' letter was extensively quoted in the press, led to discussions of a most interesting character in the *Times* and elsewhere, and brought on a crisis in the administering of the navy.

"From these discussions my own contribution—intended for publication here last week—was excluded by the chief censor on the ground that it would 'prejudice the discipline and administration of His Majesty's Naval Forces . . . . ' and be 'detrimental to the best interests of the state and an encouragement to our enemies.' If this were really likely to have been the quite unintentional results of a frank statement of my opinions, I cannot pretend to regret the article's suppression. But it is obvious that all adverse criticism of naval and military policy is open in a greater or less degree to the objection that it undermines authority, and encourages the foe. Where a critic believes the constituted authority to be acting both on a system and on a theory altogether mistaken, and sees no hope of altering either by argument, simply because its action is the expression of convictions which are unalterable—then it is almost his professed purpose to shake confidence, so as to obtain a more efficient authority in the place of that which he undermines. And it is equally obvious that it is exactly at this point that the government of the day must decide whether it is right or wrong to allow controversy of this kind to go forward. In the present case, the decision is against my promulgating my opinions. Consequently, I propose to-day to put forward in this matter no judgment of my own, but simply to summarize those opinions that have been expressed either on previous occasions by me or by others, in these columns or elsewhere.

"During the last fortnight many speeches have been delivered on the situation, notably by Lord Curzon, by the Prime Minister and by General Smuts. The King has issued a proclamation urging economy in breadstuffs; the First Lord of the Admiralty has written an important letter to representatives of various shipbuilding interests. The points raised in 'Flag-Officer's' letter have been dealt with at length in the columns of the *Times* by Professor Spenser Wilkinson, by Admiral Sir Reginald Custance, by Admiral Henderson, Mr. Winston Churchill, Lord George Hamilton and others. A distinguished French writer, Admiral Degouy, has been putting forward some very strong views on the situation in France. These contributions to the discussion include a great variety of opinions that may be summarized as follows:

"As to the first two, which were the burden of the Prime Minister's and Lord Curzon's speeches, and the King's Proclamation, there is no disagreement. Whether the submarine campaign increases its efficiency, maintains it, or falls away, the utmost economy in foodstuffs is the obvious duty of every individual. Next, whatever the qualification of our sea command now shown to exist, there is no alteration in the prospect of ultimate

victory. The naval failure does not ensure a military failure. On this point the Prime Minister's speech at the Guildhall is conclusive. It cannot be denied that we are far nearer to danger than we were—but there is no evidence that danger is near enough to be alarming. Our losses, as a distinguished admiral has said, may indeed be 'appalling,' but they are a long way from indicating either immediate or ultimate failure. It may be somewhat reassuring to remind the reader of a fact quite largely, but perhaps not generally known. It is that the rate of insurance over the worst and most dangerous channels to British ports has not yet passed 10 per cent—which is itself 50 per cent lower than was the rate from Gibraltar for a very long period between 1812 and 1815—and as this rate is naturally made in favor of the underwriter, it is probably true to say that, at the utmost, we are not now losing more than one cargo in any 12 destined for this country.

"A third line of discussion has been directed towards enquiring whether our whole policy in the matter of the submarine menace has not been entirely too defensive and—for various reasons all connected with the character of the command—unnecessarily inefficient even in defence. On the first of these points the *Daily Chronicle*, the *Spectator* and other journals of repute, have for some time been urging some scheme of offensive operations against Zeebrugge and other German bases, a matter often touched upon in these columns and at length in the earlier months of this year. The advocacy of such an offensive has been greatly strengthened by Admiral Degouy's recent pronouncement. The weakness of these lay recommendations is that they ignore the existence of the High Seas fleet. But it is certainly a matter which the government will have to consider very closely.

"On the second point a great variety of criticisms have been made. The following are only selected as chance examples. It is said that too many of the bases from which the anti-submarine craft work, are under the control of retired officers, who have, in the matter of technical familiarity with the craft and devices now in use, too little in common with those to whom the actual employment of these craft and devices is necessarily entrusted. It is also said that the central authority is in some matters over-centralized, so that the local initiative is checked; and in others lacking in wide enough powers to secure the co-ordination of all the forces that must be combined for the attack both on submarines and on their bases. It is, for instance, asserted that the command of the destroyers, the trawlers and slow craft generally, of the monitors and airships and seaplanes, is so divided and cross divided, that at critical times it is impossible to get co-operation for a common purpose. Then, too, it has been questioned whether the anti-submarine craft as a whole are rightly distributed in the various areas, in proportion to the intensity of the submarine attack in those areas. Such criticisms, it will be seen, touch almost every aspect of the constitution, co-ordination and command of the forces engaged in this vastly important business.

"Fourthly there has been a general question asked, whether the creation of a submarine department at the Admiralty is not itself the admission of a wrong view of the situation, and simply because, if once we suppose the function of the Grand fleet to be defined and its command and supply provided for, the protection of our shipping, and all in the way of offensive and defensive that this implies, is really to-day the main, if not the sole business of those responsible for the military control of our sea forces.

"The fifth and sixth groups deal with matters arising out of 'Flag-Officer's' letter of the 25th. And here it seems to be universally admitted that a separation of the military from the civil side of the Admiralty is an immediate necessity, and for that matter the unofficial communications that have been made to the press seem to promise that this separation was one, if not the chief purpose of the Prime Minister's intervention. This, of course, is an admission that the failure to deal properly with the submarine is not inherent in the nature of the problem, but arises solely from a

defective command—though it supposes that the defect is one of system, and not of military principle in those that have tried to work it. We are assured on many sides that now that this system has been, or shortly will be, changed, there need be no further occasion for anxiety, and for the sufficient reason that, once the First Lord's chief professional adviser is freed from all extraneous duties and, on the purely military side of his duties, has the assistance of a staff of his own selection, an entirely new level of efficiency may confidently be expected.

"But to the exponents of the sixth form of opinion, these assurances are apparently not convincing. These seem to follow more what 'Flag-Officer' implied than said, namely, that it was less the actual effect of a bad system at the Admiralty than the working of a vicious system by those whose minds were warped by wrong military principles, that has brought our naval misfortunes upon us. This view is very apparent in the second of Professor Spenser Wilkinson's letters and both of Sir Reginald Custance's. It is also implied in the letter from the distinguished naval officer who writes to us this week. It is almost a summary of their case to say that, had any of the members of the group that have controlled the navy since 1904 been conscious of the true military mission of the fleet, they could not have been content that the fleet should be commanded—either in peace or war—through an organization manifestly incapable of allowing the fleet to realize that mission. To these critics, therefore, the contentment during the past five months of the present directing minds of the navy with the Admiralty system, as it was and as they had always known it was, is evidence of the rest of their quarrel with the group from which these advisers are taken. And their quarrel is just this, that they have always failed to realize the main purpose for which the fleet should be used. Had this purpose been realized, it must have been found that the existing system was prejudicial to its attainment, and then nothing could have been simpler, for men who possessed the full confidence of their civil chief, than to have altered and reformed it out of hand. That the system should not be shattered on the strength of three of four articles and letters to the press, seems to these critics therefore no proof that the essential matter is secured, namely, the devotion of all our naval forces to the attack and defeat of the enemy."

REORGANIZATION OF THE ADMIRALTY.—*Admiralty Reforms.*—Referring to the formation of the new naval staff, Mr. Arthur Pollen writing in *Land and Water*, May 17, says in part:

"These changes have undoubtedly been brought about by the recent awakening of the public mind to the deplorable scale and gravity of our naval failure. In this issue is printed a series of extracts from the press, from letters of various naval authorities and from speeches in Parliament, setting out this cumulative indictment against Whitehall, the chief reasons—personal and organic—for the inefficiency displayed, and the remedies that have been proposed. How far do the reforms announced by the First Lord meet the case that has been made? The case is briefly as follows:

"(1) The navy has failed in its fundamental business—the defeat and destruction of the enemy's fleet.

"(2) Because it has failed in this, it has also failed to protect our sea supplies.

"(3) Both failures arose from the fact that the supreme command has since 1904 been monopolized by a group of officers who have prepared the navy for war and guided and commanded it in war on wrong military principles.

"(4) That these wrong principles may be said partly to have grown out of a wrong system of administration and partly to have created it.

"(5) The principal evil of the system was that it failed to discriminate between the military function of command and the civil business of construction, manufacture and supply.

"To deal with these evils it was proposed:

"(1) To revert to the old system of governing the navy by two distinct boards, the first a Board of Admiralty to command, the second a Board of Supplies.

"(2) To appoint to the Board of Admiralty only officers whose known principles and record assured the adoption and execution of an active offensive on right military lines.

"It will be seen that the changes made do not, in any part, achieve the whole program proposed in Parliament and elsewhere. The navy, for example, still remains subject to a single Board of Admiralty. But it is obviously not a board which has jointly to consider and to adopt all the vital decisions which have to be made, so that each member should be jointly and severally responsible for them. We began the war with four naval lords and five civil members of the board. There are now seven naval lords, one new lord naval by adoption, and the five civil members as before. If we count Sir Eric Geddes as a civilian, there are seven naval officers to six laymen. This body is too large and the business too great and various for joint action and several responsibility to be possible. We must infer from Sir Edward Carson's statement that, in spite of constitutional unity, there is to be a functional division. This is perhaps as near the establishment of two separate boards as the actual state of naval administration permits. Probably no more drastic reorganization is possible in war time. So that the substance of the differentiated control may be really achieved. The best guarantee of this achievement lies in the personality of the new controller. There is no man in England who has been tried in more diverse or more difficult tasks, or who has passed each trial with more perfect and assured success. It has been said that the naval lords have been constantly thwarted in the attainment of their military objects by the ill-organized machine through which they have had to work. No such difficulty will obstruct the new 'honorary and temporary' vice admiral. The man who knows precisely *what* he wants done and *how* it should be done, knows also how to remove obstruction from whatever quarter it may come.

"The first of the reforms demanded in these columns and elsewhere—namely, a dividing line between the civil and the military at Whitehall, is likely then to be realized in fact. And this is great gain for obvious reasons. The government conceded a very high proportion of the supply of raw material and of the resources of the country in shipbuilding, engineering and manufacture to the Admiralty from the very first days of the war. This vast monopoly has never been disputed by the army or by the Munitions Department, for, in this matter, no one has ever questioned the prior claims of the navy in a war in which sea power should be decisive. But it has for a long time been very questionable whether the Admiralty has put this monopoly to good use. It has indeed been almost unquestionable that it has not done so. Nor would it have been reasonable to have expected so great a miracle. We have made enormous efforts in recent years to turn some of our ablest naval officers into civilian administrators—and not entirely without success. But no officer so converted had ever attempted the task set to Rear Admiral Tudor. It is not surprising, therefore, if the rate of supply of small craft, mines and other things necessary for fighting submarines, bears no relation to that at which matériel is furnished to the army by the Munitions Ministry. And, as the efficiency of the anti-submarine work depends very largely upon the numbers of units and the abundance of matériel, the assurance that supply is now in the most efficient possible hands is of immense military moment.

"Briefly, then, the inclusion of Vice Admiral Geddes in the board should have two results of inestimable value. First, we shall get much needed matériel far more quickly. Secondly, in getting this he will have to speed up and simplify the Admiralty departments through which he works, so that we shall be left with a far more efficient administrative machine.

"But, great as is the value of this much-desired material and important as are all administrative reforms, the main object of the Admiralty critics was that the military command should be as different as it could possibly be from that which has held sway at Whitehall hitherto. Do the present reforms secure this? There are voices in the press that are extraordinarily confident. The *Daily Chronicle*, for instance, which, amongst the daily press has led the criticism, now holds up these changes as a final and complete triumph of the right. It is not content to say that the naval administration has been put on to more scientific lines. It tells us that these changes embody exactly the principle for which it has been contending—the establishment at the Admiralty of a 'fighting body,' equivalent to the General Staff at the War Office. Now a fighting body is undoubtedly what we have all been crying for. But the body presented to us is, so far as persons are concerned, exactly the same as that which, since December last, has been directing the manifold operations of the fleet. The only difference in its constitution is, that two officers who were formerly the First Sea Lord's advisers only, now become his colleagues and, we must suppose, jointly responsible with their chief for the policy recommended to the government. How far does this carry us towards the *Daily Chronicle's* principle?

"Until these changes were made, the First Lord alone was the responsible adviser of the government. Our policy, whatever it was, was then his policy—unless indeed he was content to have it overborne by others, or made nugatory by inefficient subordinates. If it was not enough of a fighting policy, would it not seem that its defects were those of its originator? This journal and the *Daily Chronicle* were on common ground in thinking this policy defective. Our contemporary now assumes that the addition of Sir Henry Oliver and Rear Admiral Duff as colleagues, will secure that the joint policy of the three admirals will be a fighting one. I yield to none in preferring the board principle to the staff principle. Yet it is a remarkable result to expect. All will sincerely hope that the expectation may be realized. But what a curious light this throws on the whole controversy! And Hotspur's question will occur to many.

"Looking at these changes as a whole, they are, while much less than was asked, or even hoped, a marked step in the right direction. They are, to begin with, an admission by the government that the fact of naval failure is recognized, and that that failure is in part to be explained by a muddled system of administration. But it is significant that whereas the critics asked for a reform of system primarily to secure a more efficient military command, the most drastic of the reforms is directed solely towards bettering the civil side of the administration. There is an obvious reason for this. It is a matter in which the Prime Minister is himself an expert. The man who originated the Ministry of Munitions has a right to be an optimist on the help that the lavish supply of material can afford to a fighting force. And he quite understands how to secure that the supply shall be lavish. But the right professional control of the navy is a more recondite matter. To understand it requires tedious study; to select from the service those likely to ensure it, needs both a comprehension of the principles in issue and a real knowledge of the qualifications of, let us say, the senior 200 officers on the navy list. It is safe to say that no one outside the navy combines these two forms of knowledge—and very few within it. Let our final observations on the changes be this. They promise a higher degree of success in obtaining a very important, but withal the least important, need of the navy to-day. It will need time before the second, and more important, reform can be sufficiently understood to be realized.

"How hard an affair it is to understand and apply the principles of sea war may be gathered from a contribution to the recent correspondence in these columns and the *Times*. Lord George Hamilton, admitting the rightness of the principle put forward by Sir Reginald Custance, wrote as follows in a letter published on May 8:

"'Why have not the very competent naval officers who have been controlling operations adopted the policy (of destroying the enemy's armed fleet) during the present war? I assume the answer is incontrovertible—that the power of the defensive in the shape of submarines, forts and long-range guns, has so enormously increased in proportion to offensive power, that to attempt to force an action upon a fleet so protected is to incur almost certain disaster for the attacking units.'

"Lord George then continues as follows:

"'The defensive in warfare, both on sea and land, has of recent years obtained a mastery over the offensive, and the old slap-dash methods of attack either on sea or land, are impracticable unless disaster is to be cultivated.' He went on to raise a point with regard to the submarine war and with this and the allegation that the old methods of war were slap-dash, Admiral Custance dealt, in what seems a very final manner. But the admiral left the rest of the two statements that I have quoted without comment. They amount to this:

"(1) A fleet, protected by submarines, forts and long-range guns—and Lord George might have added mines—cannot be attacked by another fleet without the certainty of a disaster.

"(2) In sea war generally, the defensive has obtained a mastery over the offensive.

"These two propositions, his lordship takes to be incontrovertible. Let us see if this is so.

"The British grand fleet certainly cannot attack the High Seas fleet in harbor while protected by submarines, mines and forts. It was not built for this kind of fighting. But a fleet proof against torpedo and mines and almost proof against gunfire, could certainly be built. Such a fleet could probably be brought close enough to destroy a fleet in harbor, certainly close enough so to obstruct its exit—with mines and other suitable devices—as to neutralize the fleet for a considerable period. Many schemes for this kind of attack were worked out before war began and, had our policy been determined by offensive, it could have been prepared for and made effective without inordinate loss. Has it ever been even considered?

"Lord George Hamilton's second proposition is far wider. He would have us believe that in a sea battle, the defensive has recently obtained the mastery. But is not the exact reverse of this the truth? Before the war, everyone seemed positive that modern dreadnought fleets—so deadly was the accuracy and so terrific the power of their guns—would destroy each other with grim rapidity. It is still pretty certain that no capital ship of to-day could survive 30 hits from its own guns at any range. And, as a hundred rounds can be fired in less than 10 minutes, a moderate success in hitting would justify the pre-war anticipation. Never in the history of naval war has the relative superiority of the gun over its target been greater. The reason actions have been indecisive or prolonged is not due to the masterful defensive properties of modern ships, but to the fact that the requisite hitting has not taken place. The *Gneisenau*, for instance was in action from one o'clock till six, not because she could stand five hours' hammering by sixteen 12-inch guns, but because it took five hours for sixteen 12-inch guns to make the dozen or so hits that finally knocked her out.

"The only new thing in the way of defensive that a modern fleet possesses in action is an advantage, which may be only temporary, in the use of torpedoes. It is an advantage that only accrues when it is in retreat. If a torpedo and its target are approaching from opposite directions, the effective range must necessarily be much greater than when the torpedo is pursuing a ship which retreats in the same direction as itself. A runaway fleet, then, has two long-range weapons while the pursuing fleet has only one. But if the conditions of the action are such—as when fleets are on parallel courses and opposite each other—that the attacking fleet can close to short

range, say six or seven thousand yards, then the conditions will be the same for both sides alike in the use of the torpedo and of the gun.

"The issue raised by those who question our tactics at Jutland is simply this. Should the menace held over an attacking fleet by the torpedoes of the weaker be faced if facing the risk affords the only chance of decisive victory? Those who say that the risk cannot be faced explain the refusal to do so by the belief that a torpedo hit is necessarily fatal. But the facts do not justify them. In 1915 two modern ships, the German *Moltke*, and the British *Roxburgh*, were torpedoed by submarines. At Jutland 11 German and one British capital ships were hit. Since then, one, if not two, enemy dreadnoughts, one enemy, and two British cruisers, and at least one of our destroyers have been hit also. Of these 18 or 19 instances, only one German capital ship and the two small British cruisers were sunk. It is unlikely that the *Pommern* was destroyed by a single torpedo, and, in the case of *Falmouth* and *Nottingham*, we know that one was struck by four and the other by three torpedoes. And *Marlborough*, torpedoed quite early in the Jutland fight, kept her place in the squadron and fired with vigor and regularity afterwards. There seems, then, to be very little case for saying that the torpedo risk should be a legitimate deterrent.

"On the other hand, other experiences of war show that the single shot from a big gun may bring about results which few anticipated. In the Dogger Bank affair *Lion* was incapacitated by a shell which damaged one of her engines. It is true that she was not lost, but the chances of victory were, so that this unhappy shot may be said to have been decisive. And at Jutland there seems to be every reason for believing that *Queen Mary, Indefatigable*, and *Invincible* were none of them crushed by gunfire and gradually reduced to impotence and then destroyed, but that all simply fell to single unlucky hits that caused internal explosions. Actually then experience of war teaches us that 13 capital ships may be struck by single torpedoes without one being sunk, while of the comparatively small number of battle cruisers that have been in action, four were destroyed, or eliminated from the battle by single shells. Would anyone on these facts hold that a fleet of battle cruisers, twice as numerous as that of the enemy and with anything from three to four times its gunfire, must *as a mater of course*, be kept outside the range of the enemy's guns? It seems a wildly absurd proposition—though it is of course, true that when the dreadnought type was designed one of the tactical advantages claimed for it was that such a ship would be able to destroy its enemy while keeping out of the enemy's range. But in theory I can see no way of distinguishing between the shell risk and the torpedo risk.

"How are we to explain how so accomplished and experienced a student of naval affairs as Lord George Hamilton should set up the proposition that the mastery of the defensive at sea is 'incontrovertible?' I suggest that he does so, because this was the principle which, as a simple matter of fact, governed the command of the British fleet at Jutland, and it is inconceivable to Lord George that the principle can be erroneous. And does not this in turn explain our continued proclivity to the school that holds such doctrines? The predominant minds in this cabinet, just as in its six predecessors back to 1906, have been accustomed to believe a certain naval policy, arising out of certain principles, unquestionably right. They assume, therefore, that what has followed from this policy in action, must be right also. Events therefore, that appear to others—who hold different principles —to be almost stupefying in their error, seem to them just natural and inevitable."

The following editorial appeared in *Land and Water*, May 17:

THE INDICTMENT

Land and Water, April 19.—"The chiefs of the greatest navy in the world have simply failed in so crucial, yet elementary, a duty as protecting the sea-borne commerce of a sea-girt people."

Land and Water, February 8.—"In August, 1914, people asked how Germany's invincible land army could be balanced by Great Britain's invincible sea fleet. It is part of the topsyturvydom in which we live that the greatest land force and the greatest sea force in the world have achieved everything expected of them—except victory. The failure to achieve victory has given time to each side. Time, in which we have been able to produce a new kind of army that Germany will not be able to resist, time for Germany to produce a new kind of navy which we do not seem yet able to fight."

Land and Water, February 15.—"The Admiralty's two immediate functions have during the last two months been made the care of an organization very greatly extended from that formerly charged with it, and the direct head of this organization is the First Sea Lord himself. The two main aspects of the submarine campaign then are, and for two months have been, directly under Sir John Jellicoe. He has, to carry out the policy resolved on, an organization of captains and commanders directed by a rear admiral."

Land and Water, February 22.—"The chief vice of the Fisher system was this. The First Sea Lord was to be an autocrat. He was surrounded by advisers, Controller, Director of Naval Ordnance, etc.; each of whom was an autocrat, too, so long, of course, as he did not interfere with the major autocracy of his chief. The effect of this was to create a special caste quite distinct and, with one or two notable exceptions, quite foreign to the naval service. It could only continue by the suppression of all independent thinking in the navy."

THE REASONS FOR FAILURE

(1) *The Personnel of the Higher Command.*—"Mr. Balfour has hitherto thought it premature to change (his advisers), probably for the reason that the course of the war has not indicated with sufficient clearness those who are marked out to succeed them. This vagueness as to the fitness of men is part of the penalty we pay for the fact that, in the 10 years preceding the war, naval administration was *entirely in the hands of one school of naval thought* which had *held the study of* the principles of *naval war*—as exhibited by history and analysis—*in absolute contempt.* This predominance had the result that almost all officers who had less faith in mere material than in military principle, who believed that war could be trained for by scientific methods, were ostracized both from high commands and from posts of administrative responsibility. What may be called the historical and technical schools of thought, therefore, never had a chance of achieving that welding of past experience with modern weapons on the achievement of which, as everyone can now see, the successful use of new material can alone be based. It was the proscription of these officers that really explains the anarchy of thought that prevailed at Whitehall in the closing years of peace, and it is no wonder if it is a difficult thing now to pick out the men who best combine personal ability with the grip of the right principles on which their energies should be employed. Mr. Balfour, having once found that the situation had not been met by the blind acceptance of the advisers he inherited, may now find that *it may not be his first or even his second choice of advisers* that will meet the case. But the past at least has this lesson, that, could a new occasion for revising appointments arise, it may be acted on with great alacrity."—*Land and Water,* November 30, 1916.

(2) *The System.*—"The function of the Admiralty is to produce and command a *purely military force,* the fleet. The production and administration of this force constitute, no doubt, a colossal task, but nine-tenths of it is *purely civilian in its character* . . . . I believe that the real reason why the Admiralty has broken down in this war is, first, that we have jumbled all the functions, civilian and military together, and shoved them on to a single board.

"It remains to point the moral of this experience. If we wish our sea forces put to their proper use, it is an indispensable first step to arrange that the chief command shall be organized on scientific principles. This is impossible without recognizing two axioms. First, we must distinguish absolutely between the *authority responsible for the military handling of the navy*, and the authority responsible for its material supply. Unless this is done it is hopeless to think that the fighting instinct of the navy can be given its full expression or scope. Next, in arranging for its military direction, we must recognize what the wisdom of our ancestors discovered, to wit, that the employment of sea force is surrounded by so many and such subtle problems that the supreme control *cannot be entrusted to a single individual*, but *must be carried on by a board*, the *chief professional member of which though the chief, is only* primus inter pares.

"The application of these principles to present circumstances would necessitate the partition of the work of the Admiralty between two bodies—one *a Board of Admiralty*, the other *a Board of Supply*."—FLAG OFFICER in *Land and Water*, April 26.

(3) *The Voice of Authority.*—"The chief department of any fighting organization should surely be that which designs and directs the fighting. What I understand 'Flag Officer' to desire is that the duties of military design and direction, with all that properly belongs to them, should be grouped into one department, at the head of which should be placed an admiral *selected for his capacity as a war commander or director*. That arrangement would leave the supply of the navy, with its matériel, to the Third Sea Lord, or Controller, the manning and discipline to the Second Sea Lord, and the supplies and transport to the fourth, while it would provide the government with a qualified adviser in regard to the strategical distribution of the navy in the person of the First Sea Lord.

"What 'Flag-Officer' now asks the members of the Cabinet to do is to fill up a gap in the organization by appointing a special officer to take charge, under their own authority, of the conduct of the naval war. The moment they decide to do that they will see the advisability of selecting for the task some officer *who has taken the only means of acquiring mastery of that particular business—has devoted his life to nothing else*."—PROFESSOR SPENSER WILKINSON in the *Times* on May 4.

"Out of twelve and a half years immediately preceding the war, Sir John Jellicoe spent nearly eight at the Admiralty and more than six in taking care of matériel, which is certainly not the best training either for a commander-in-chief or for a First Sea Lord in war time, when our first consideration is not so much the preservation of our own matériel as the destruction of the enemy's at a legitimate cost."—*Truth*, May 2.

"The Prime Minister, in his recent speech at the Guildhall, is reported to have said that one way to deal with the submarine was to destroy it or to render it innocuous. He added that 'the best brains available in this country and America, and to a more limited extent, in France, are applying their energies to that problem.' This seems to mean that reliance is placed on some mechanical invention to solve the present difficulties. May I be permitted to point out that, while it is most necessary to make the utmost use of all mechanical ability in the Allied countries, *no mechanical invention will be of any avail if the military policy is unsound?* The problem is essentially military, and not mechanical. Its solution depends upon the correct military use of the naval armed force. Is the Prime Minister quite sure that the great naval preponderance of the Allies has been, and is being used to the best advantage?"—ADMIRAL SIR REGINALD CUSTANCE in the *Times* of May 4.

"The cause of the tactical failure to take advantage of the opportunities to destroy the German armed ships were explained by Admiral Sir John Jellicoe in his speech at the Fishmongers Hall on January 11, 1917. He is reported to have said that 'the torpedo, as fired from surface vessels, is

effective certainly up to 10,000 yards' range, and this requires that a ship shall keep beyond that distance to fight her guns.' This is the logical result of the doctrine that the destruction of the enemy's armed ships is only of secondary importance. A superior fleet, however favorable may be the opportunity, is not to close to decisive gun ranges because some of the ship may be hit by torpedoes. Of what use is a greatly superior fleet if no part of it is to be risked when the decisive moment arrives?

"On these salient facts, *is there not reasonable ground to believe that the directing naval minds during recent years have not been imbued with true conception of war,* and that our present difficulties are traceable to that cause? Is it likely that *any changes in* the mechanism of the *administration will be of any avail so long as the controlling minds believe* that, even under circumstances favorable to victory, *the safety of our ships is more important than the destruction of the enemy?*"—ADMIRAL SIR REGINALD CUSTANCE in the *Times* on May 7.

THE PRESS

"While not necessarily agreeing with all his views, we have long been much impressed with Mr. Pollen's argument for the reorganization of the Admiralty and the formation of a proper General Staff there, and we notice an endorsement of it by a 'Flag-Officer' in this week's *Land and Water,* which merits special attention in the circumstances."—*New Statesman,* April 28.

"It is conceivable that no other administrative order than that which at present rules within the Admiralty would have succeeded; but the present order has failed. A writer in *Land and Water,* apparently exceedingly well informed, suggests that there is room for a far more scientific division of functions among the Sea Lords and the civilian members than is at present practised."—*Daily News,* leading article, April 27.

"The bare statement of these facts is enough to prove that the constitution of the War Staff Group is essentially defective. It is saturated with office routine and book-knowledge, but it knows relatively nothing by experience of the actual conditions of modern warfare, and although the First Sea Lord is an exception, *his only action, and his own subsequent comments upon it prove* that it *may not be advisable* to have at the supreme head of a fighting service *an officer who,* through past experience, is *necessarily imbued above all things with* the *supreme care of matériel* born of years of work as an officer of supply—work which *in itself militates against* the study of war and a realization and *acceptance of the risks that must be run if victory is to be achieved.*"—*Truth,* May 2.

"We venture to say that this action (the suppression of Mr. Pollen's article by the Censor) will excite the most profound dissatisfaction in every thoughtful mind. Mr. Pollen is beyond all question the best and the ablest writer on naval matters not only in this country but in all the Allied countries. His reputation is hardly second to that of the late Admiral Mahan. Throughout the war he has consistently expounded the views of the Senior Service. He has in our view gone too far in his fidelity to the official hierarchy, and in his effort to represent everything that has been done or left undone in the most favorable light."—*Star,* leading article, May 3.

"Why may not Mr. Pollen say, with or without variations, what so many of us have already said? The only answer that I can see to that question is that he went a good deal beyond everybody else in dotting his i's and crossing his t's. Not content to confine himself to abstract principles of administration, he pointed out that various episodes in the present war, which the public has been taught to regard as glorious victories, have really exemplified the vicious results of the system which he condemns. He impeached a 'school' which has grown up at Whitehall under the present system; he did not except the First Sea Lord from his criticism; and he insisted that we must not only reform the consititution of the Admiralty,

but sweep away a 'dynasty' in the Russian manner. Now all this may sound like sedition in the ears of the mandarins; but it is rather a large order that they should take upon themselves to decree that nothing of this nature may be uttered in war time."—SCRUTATOR in *Truth*, May 9.

DEBATE IN PARLIAMENT, MAY 9

Mr. G. Lambert: "It seems to me that the Admiralty are showing too great a sensitiveness to criticism. They suppressed, or the Censor suppressed, an article in *Land and Water*—I think it was in last week's issue. I have had the privilege of reading that article, and although I disagree with Mr. Pollen, who wrote it, there is not one single word in that article which is not inspired by the most patriotic sentiments. It is said that to publish this article would give encouragement to our enemies. I hardly agree, but I do say that it exposes the Admiralty to the charge of trying to suppress criticism of their own action when they censor an article like Mr. Pollen's, which was inspired only with a desire to spur the Admiralty on to greater exertions."

Mr. Houston: "It would be the irony of fate if we, the greatest naval and maritime power in the world, should be winning the war on land and be checkmated on the sea, and by reason of one branch of naval architecture of which the country had warning."

Mr. Houston: "The submarine peril ought to have been seen, and was seen. Why, then, was it not dealt with? Because the Admiralty was in a state of somnolence or sleeping sickness for a considerable period. I know a good deal which I dare not say, but I would like to know many things in connection with the Admiralty that were in existence there when the present First Lord went there."

Commander Bellairs: "I would venture to say to the representatives of the Admiralty that they must not be too intolerant towards critics. After all, Mr. Pollen is a very responsible critic, and he is, in my judgment, one of the best informed critics, if not the best informed critic, in the public press to-day. Now that naval officers themselves are prevented from criticizing, and prevented from discussing things in public, we cannot too much encourage critics of the caliber of Mr. Pollen."

Mr. Pringle: "An article was written by Mr. Pollen, a very distinguished naval expert who, I think, has written on naval affairs every week continuously from the beginning of the war. He has contributed to many publications, and I think he has established with the public, generally, a reputation for sobriety and soundness of criticism to which few military or naval experts can lay claim. Well, one of his usual articles was sent to *Land and Water* last week, and the right to publish it was refused by the Admiralty. We do not know the precise grounds; we know that this was an article criticising the Admiralty administration. We know that criticism was expressed in very strong terms. I think the article stated—I have not seen the article, but I am so told—that the situation in regard to the Admiralty had become so serious that it was now a question whether the army would be able to win the war before the navy lost it. That has been said in other periodicals. There is a good deal of justification for such a statement. Undoubtedly the inaction and negligence of those at present responsible for the Admiralty was subjected to very severe criticism. What is the situation? This article was submitted precisely to the people who were criticised. They naturally decided that the criticism was unjustifiable, that it might cause alarm and disquiet in the country and possibly that it would give information to our enemies. Apparently these were the grounds on which publication was refused.

"We require some more detailed defence than has yet been given. The country is not at all satisfied with regard to the record of the Admiralty in respect to publicity in the past."

Dr. Macnamara: "I deny any suggestion that we use the censorship because we do not want to be criticised."

Mr. Holt: "Do I understand that the Admiralty would object to an article which does not show that an officer holding a high naval command is professionally incompetent?"

Dr. Macnamara: "The only question we should take to criticism would be based on a sense of public duty. I noticed that that observation was a source of considerable merriment to my hon. friend."

Mr. Holt: "Yes."

Dr. Macnamara: "Well, leave it at that! This particular article was not in any way one the purpose of which was not to attack the civil authorities. The chief Censor came to the conclusion deliberately that its publication would be calculated to prejudice discipline, and the First Lord fully and completely concurred, and gave his view—which I have already stated to the House—considering that it would certainly be not less calculated to encourage the enemy. That its author, like all of us, was patriotically minded, I have no doubt. That the last thing he desired to do was to encourage the enemy, I have no doubt."

THE SEQUEL

"On Monday, May 14, it was announced that Sir John Jellicoe, First Sea Lord, was to have the additional title of Chief of the Naval Staff, that Vice Admiral Sir Henry Oliver was to join the Board of Admiralty as Deputy Chief, and Rear Admiral Alexander Duff as Assistant Chief of the Naval Staff. Major General Sir Eric Geddes was to become a vice admiral and controller of the navy; Rear Admiral Halsey, Third Sea Lord and Rear Admiral Hugh Tothill, Fourth Sea Lord. The object of these changes was twofold. The first is to free the First Sea Lord and heads of the naval staff 'as far as possible for administrative work' so that they may concentrate their attention on the naval conduct of the war. The second object is to provide a naval parallel to the Ministry of Munitions."

THE POSITION OF GREAT BRITAIN AT SEA.—The following article by Mr. Arthur Pollen commenting upon the recent changes in the administration of the British fleet appeared in *Land and Water*, May 24:

"We saw that the case put forward by the critics was chiefly that our troubles derived inevitably from the defects of the Supreme Naval Command that has had the British fleet under its authority for the last 14 years. This Command seemed to have been actuated by unwarlike principles, but particularly by an unmilitary spirit, and that these were reflected both in our general naval strategy, in our system of central administration, but most of all by our attitude towards the business of fighting and destroying the enemy's main fleet. It was thus a comprehensive case covering our preparations for war, our naval policy during the war, and what seemed to be our present purposes. We noted the fact that this agitation had been met by a reorganization, but that the chief purpose of this seemed to be to strengthen the civil side of the administration while leaving all the essential matters which our military policy had brought into debate, untouched. This, no doubt, was to a large extent due to a phenomenon which is far from unusual when an alteration of policy is forced upon government by the threat of public opinion becoming generally adverse to it. I refer to the ease with which a skilful government can avail itself of the fact that only a small portion of those who express the public uneasiness understand precisely what is wrong, and that the majority can be pacified by changes which may mean very little, and by reforms that leave all the essential things unaltered. And in this particular case the situation was complicated by outside considerations that had no direct relation to the main issue. The agitation had hardly been proceeding for more than a week when the enemy submarine successes doubled, and the government had hardly put an official term to it before they

became what, in view of our unhappy experiences since February, we must call normal. So that actually, there were a good many innocent souls who looked upon this debate as having been caused by a mild kind of panic over our losses and doomed, therefore, to fade away if only those losses fell to limits to which we were all generally resigned.

"But those who think—and fortunately, their numbers are not inconsiderable—are still interested in, and must remain deeply concerned over the right employment of our naval power. And the Admiralty changes and the very gratifying drop in the submarine returns notwithstanding, there is a great deal to set them wondering whether things can possibly be as they should be. It is notable, for instance, that the discussion of the main principle which underlies the use of sea power still continues in the columns of *The Times*. On Monday two very helpful letters on this subject by Admirals Custance and Henderson appeared. They are useful for two reasons. Admiral Custance establishes the axiom, and this time quite finally, that the main purpose of a fighting force must obviously be to fight; that all its activities must be steps towards fighting or operations made possible by fighting. So that unless the command of the fighting force has this central fact as its main objective in building, training and disposing of its forces, unless it puts those in command whose attitude towards fighting is orthodox and whose training, therefore, of their subordinate colleagues, admirals and captains, is entirely with this same objective in view, the forces in question must be wasted. So deeply seized is Admiral Custance with this truth, so clearly is it inculcated by the whole history and tradition of the British Navy that like the scientific historian that he is, he is constrained to seek for an explanation of a contrary theory having held the field for so long. And he believes he has found it in certain statements of the strategy underlying naval war which began to gain currency in 1906 and have since been developed in various directions by various writers.

"In the first statement of these theories no mention was made of decisive battle and, in subsequent statements in Admiralty memoranda, and in the schemes of naval maneuvers put forward from time to time, Admiral Custance has detected applications of it which seem to him to demonstrate convincingly that, as a fact, their authors had failed to perceive that it is victory and victory only that can give those advantages in war comprehensively included in the phrase 'Command of the Sea.' And from all this he makes the deduction that it is the theory and nothing else that blinded our naval leaders, from 1900 onwards, to the true gospel of sea power, the basic article of which is the central fact of battle.

"The theory may be briefly stated thus. The advantage which superiority at sea confers in war is the power to straiten your enemy by cutting off his sea supplies, and the power of invading him directly or indirectly by using the sea as a line of communication for your armies, and, while doing these things, safeguarding your own use of the seas from the enemy's attack. The enemy can only relieve himself from such sea pressure by victory over the fleet through which it is inflicted. If he does not attempt to ward these evils at the beginning of the war, he keeps his fleet in harbors. Then if you blockade and invade, you are doing him the maximum of sea harm and to this he must submit until he comes out to fight. By attacking his communications, that is to say, you make him choose between submission and fighting. If you force him to fight and then beat him decisively, he no longer has any alternative choice. He has to submit because he can do no other. The exponents of this theory would go on to say that it is normal in sea war for the opposing main forces to be of unequal strength; it is also normal for the weaker to remain in harbor and to wait for some fortunate combination of circumstances before risking its fleet in battle. So that as a simple matter of historical fact, and apart from history, as a simple matter of obvious precept, the

right beginning of any sea war by a power possessing superior sea force, is to go straight for inflicting the maximum sea pressure, for then the enemy either declines battle and submits to siege, or faces battle and is beaten, so that he not only finally has to submit to siege, but submits to it without the possibility of relief.

"Now it will be observed, that what we will call the 'communication theory' of war, is built up round the truth that battle is at once the primary object and the conditioning factor of successful sea war. Those who grasp this truth cannot possibly weaken in their hold on its luminous self-sufficiency by any refinement or elaboration of the theory derived from it. But it must be admitted that those who do not perceive this truth at all, but hold that the possession of an invincible fleet is exactly the same thing as possessing a victorious fleet, are in the gravest possible danger of finding a confirmation of their heresy in a theory which is only true if derived from a truth greater than itself.

"The essentials of the situation remain the same. We are still, in the strange phrase of Prof. Pollard, 'defending our command of the sea.' We have been at it some time. Let us review a year of this procedure. In the early part of 1916 the German Navy was just beginning to receive a steady monthly supply of the submarines under the program laid down by Tirpitz in December, 1914. These, with what had survived the 1915 campaigns, were to be thrown upon the ships serving these islands and our Allies in a ruthless campaign in the month of March. The proposal led to a fierce political controversy which had some curious developments. The parties to the controversy were first the grand admiral and his followers, who were out for an immediate and crushing blow against England, regardless of any consequences to the neutrals or to the course which any neutral might take. They were opposed by two groups who had one point in common. Neither believed that Tirpitz could make good his threats. One party disbelieved altogether in the theory that the submarine could defeat the surface ship, and they saw in the threat a considerable danger in an exasperated neutral world, a danger not limited to the possibility of new belligerents appearing against the Fatherland, but extending to the certainty that, after the war was over, Germany would be left without a single market where her traders or her trade would be welcome. They were against Tirpitz, therefore, because they thought the whole scheme of submarine war doomed to failure. The other group were perfectly indifferent to everything except success, but thought that Tirpitz would fail, not because his theory of blockade by under sea was unsound, but because he did not possess an adequate number of submarines to make it effective. It was this party that carried the day. But Tirpitz' friends had done their work of popular propaganda too well, and his dismissal was followed by an agitation which made the beginning of a ruthless campaign imperative. But it was disappointing in that the bag of ships was relatively small, and it was disconcerting in that President Wilson had no difficulty in uniting both Houses of Congress in agreeing on an ultimatum. The Germans wisely ended the campaign at once, while reserving liberty to recommence it, nominally if America failed in getting Great Britain to modify the blockade, really, of course, postponing its recommencement until there were enough boats in hand for a real success to be possible, should the military position become so desperate that American belligerency could not possibly make it worse.

"The result naturally disappointed the German people, and it became necessary to reassert the Fatherland's prestige at sea. There ensued the bombardment of Lowestoft and the sortie of the fleet which resulted in the battle of Jutland. The British losses and the return of all the greater German units, except two, to harbor was made the occasion for proclaiming a German victory. And we can readily understand that, to the people of Germany, the mere fact that so superior a force as the combined grand fleet and battle cruiser fleet had first been engaged so cheaply, and

then evaded so dexterously, must have appeared an achievement of almost infinite excellence. But it had this disadvantage. More still was expected from the victorious force. By the late summer further sorties were made, but each time with disastrous results, and by September it had become necessary to revive sea activity in a different way. From August, therefore, until January, the submarine campaign was pushed as far as it could go without systematic sinking at sight, and in the late autumn there began that series of offensive movements by the Zeebrugge flotillas which have continued uninterruptedly until now. And as we all know, in February, by which time a year's product of the submarine building program was in reserve, the present ruthless campaign was put in force.

"But except for this difference—and it is, of course, an enormous and momentous one—the general naval situation remains the same. We are, that is to say, still possessed of a fleet overwhelmingly superior to that of the enemy, but have apparently found no means of using that fleet actively in the common cause. We are still the targets of German attacks. The enemy still have the initiative.

"It is not surprising that people should be somewhat worried, irritated and impatient. Hardly a week passes but we hear that Ramsgate or Dover or some point on the East coast, or Dunkirk, is bombarded by the enemy's destroyers from Zeebrugge. And the accounts that reach us of our counterstrokes do not somehow seem to be very convincing. If monitors can only be used against land forts when a sea fog prevents the monitors from being seen from them, then it is difficult to believe that the fire of the monitors themselves can be directed with any precision against any specific target in Zeebrugge. The world has some experience now of bombardments, whether from aeroplanes or naval guns or howitzers. And the astounding truth has come home to us that however formidable the projectiles employed may be, unless they are directed with almost perfect accuracy the amount of military damage done is trivially insignificant. So that we are left wondering whether Zeebrugge suffered at all, and when we hear that the week afterwards Dunkirk has been heavily shelled, we are at any rate confirmed in our suspicion that the enemy's war craft from Zeebrugge can certainly not have been destroyed. And apart from this bombardment we hear of no attempts against the enemy's bases.

Again, many people are wondering why it is that we hear nothing of combined naval and military operations in any of the many fields in which we are fighting. We know, of course, that Sir Stanley Maude is using the river for his transport and that the transport can defend itself by the armament that it carries. But we also know that the Turks are being attacked in Palestine from Egypt and that the railway on which the enemy depends for his communications runs within 50 miles of the sea, from where we are now camped opposite to each other all the way to Alexandretta, and we hear of no naval operations to cut it. Yet this was the scene of famous amphibious operations in previous wars, and it seems strange that no work should be found for the navy here now. Is it possible that the wrong employment of the fleet to perform a military operation at the Dardanelles and its unfortunate result in making the completion of the operation by the military impossible, has resulted in the belief that no combined operations are ever to be attempted at all? Then nearer home there have not been lacking voices both in the French and British Press, asking why nothing has been done to terminate the German tenure of Zeebrugge altogether. Again, one is tempted to ask, has the whole scheme of the allied offensive for 1917 been worked out exactly as if the co-operation of sea force was too negligible a factor for consideration? Will the newly organized War Staff help us to some more inspiring policy for our great and gallant sea forces?

"Thus we seem to be in a galling position of acting wholly on the defensive with the initiative left to the enemy. Now it would be quite

unreasonable not to recognize that to some extent, and indeed to a great extent, this is inevitable. We must remember that there are two kinds of war and that they are two very different kinds of war. There is the war between two great organized forces and there is guerilla war. We see the one kind going forward on the continent of Europe to-day. We saw the other in the Boer war, when there was never a pitched battle that decided the fate of the campaign from the beginning to the end. Had we at Jutland taken or destroyed the German fleet, there would still have been many possibilities for such guerilla war as is proceeding now, though the absence of the High Seas fleet would have made it possible for us to have played our part in so different a way as to have robbed it of many of its terrors, still the fact remains that the enemy would have had many opportunities for attack both by submarine and destroyers, that the initiative in this attack would have rested with him, and that though our counter offensive would have been more direct and on a far greater scale we should still have had to put up with the spectacle of lost ships, raided transport routes and bombarded towns—all things of a galling and humiliating character.

"Things being as they are, is it possible to form any just estimate of the total efficiency of the enemy's attack and of its ultimate effect upon the issue of the war? In the first three months of the ruthless campaign the enemy sank 347 British ships of all sizes. Their tonnage we do not know, and naturally, the actual tonnage lost must have varied a great deal week by week. But in the days when the lost tonnage was published, it was generally found, over most periods of a month or two, that the average tonnage varied between 2800 and 3300. So that if we took a mean figure of something over 3000, we should probably not be very far wrong. This would give a loss of British tonnage over three months of about 1,100,000 tons. And if this continued, we should lose, say, four and a half million tons in the course of a year. On May 10 Lord Curzon told us that at the end of December, 1916, the British merchant fleet amounted to just short of 20,000,000 tons. We have been losing, therefore, since the first of February, at the rate of nearly 25 per cent per annum. If this rate were maintained and no new shipping could be substituted, what would be the result? It seems reasonable to suppose that without any stringent compulsory rationing, public discipline should be equal to effecting very nearly a 20 per cent reduction in consumption of food and other necessaries. If the harvest is good and the new land under cultivation turns out even reasonably well, the difference between the public economies and the reduced supplies should be made up, and if it were so, then by February 1 next year it would be almost a case of as you were.

But there are obviously two other possibilities. The submarine campaign may increase in efficiency, as it did for three weeks at the end of April, or our counter-campaign may grow in force and the power of the U-boats be correspondingly diminished. If the first alternative materializes or seems at all likely to, there should be a radical change made in the use to which we are putting our shipbuilding facilities. It is not, indeed, clear to me that, even without an increase of submarine activity we are certainly right in concentrating on the building of trade ships. This may sound quite inconsistent with what I have been urging in these columns for the last 18 months; but the inconsistency is apparent only. When our rate of loss was at the rate of a million and a half tons per annum and it could be assumed that the Admiralty's share of the shipbuilding was being devoted solely to anti-submarine craft, then to concentrate on making good our losses was reasonable for two reasons. All that could be done to prevent losses was being done, and the losses themselves were on a scale that our shipbuilding capacity could compete with. But with the rate of loss doubled and trebled an entirely different set of considerations came in. If you are losing between four and five million tons of merchant shipping a year and

can only build one million, the question immediately arises whether the labor and material expressed by these million tons of merchant shipping could not be more profitably invested in an equivalent amount of submarine-hunting craft. Could not, in other words, a million tons of slow destroyers, or fast patrols, save a great deal more than a million tons of shipping before the year was out? It is only another way of saying that unless the problem of sea supply is looked upon primarily as military and not economic, as a naval question and not a food question, our last state may be worse than our first.

"On the other hand it seems unreasonable to suppose that the rate of destruction can be increased or even maintained. Since the principal members of the present board have been in office, between 400 and 500 British ships have been sunk and quite possibly an equal number of neutral and Allied. The forces all round the coasts and in the Atlantic have thus had an enormous and varied experience. There are, too, the testimonies of many hundreds of merchant ship captains. The amount of knowledge of the subject must be enormously greater than it has ever been. It has been acquired under a great stress. It must be presumed that it has been studied and sifted with an equal diligence and care. We are told from time to time that no specific or panacea against the submarine has yet been found. Probably it never will be. The submarine is the extreme case of the guerilla and must be met now, as ever, by as far as possible limiting the areas in which its operations can be profitable and in protecting those areas as completely as possible. Of the general character of the anti-submarine campaign there has been no uncertainty from the beginning. To arrive at the best devices for employment in the campaign is purely a matter of making the best possible analysis of the conditions, and making that analysis available to those who have the mechanical and scientific knowledge necessary for devising the various remedies which the analysis shows to be needed. The main points are then, the restriction of areas and the ubiquity of the counter-offensive units in those areas, an intelligent organization of the forces engaged, scientific sifting of the results, the concerted study of the conditions revealed. Everything, that is, turns on efficient command.

"It is all to the good that in these matters we are being assisted by units and officers of the American Navy. Those who have had the privilege of hearing these officers speak of their reception by the British service, not only in London but in the bases from which they are to operate, must be singularly dull if they do not see, in the delightful enthusiasm of our new Allies and in their virile intelligence, elements of hope of the most gratifying kind."

PATROL BOATS AND THEIR OPERATIONS.—Captan Good, late of the British Army, who is now consulting engineer for the Sterling-Sunbeam Airplane engine, said in part:

". . . . Perhaps the actions and experiences of the little submarine destroyers, some powered with Sterling engines, in European service might interest you.

"There are thousands of these little boats daily combing the North Sea for submarines. Overhead a dirigible of the blimp type soars, steadily zigzagging along a prescribed territory. Suddenly 'Fritz' is sighted—quickly the wireless operator in the blimp flashes a message to the pair of chasers—directing their operations towards the submarine. 'Fritz' is a wary craft, and with his boat adorned in alternate shades of blue and violet, covered with the mosses and barnacles of the sea, he is a hard proposition to discern. The little chasers, gathering speed, proceed along the course taken by the submarine and, when in his immediate vicinity, drop between them a copper wire net. Dragging this along back of them, they rapidly overtake the submarine and the blades of the propeller, catching in the

mesh of the copper net, quickly bring Fritz to a standstill. Immediately the captain of the U-boat starts to rise. As soon as his periscope clears the surface of the water a steady stream of lightning rapidity emanates from the rapid-firing guns of the chaser and the eye of the periscope disappears. Blinded, Fritz still continues to rise, and as the front deck of the submarine comes out of the water, a hatch crashes open, and a 4.5 comes into view. It then becomes a question of which is the quicker shot. If the little chaser gets in the first wallop with her 3-pounder, the submarine is finished, but once they train their 4.5's on the destroyer, they smash these boats up like match boxes. Sometimes Fritz's compressors are not working properly and there is insufficient air to force the water from the compartments; in that case he has to lie below the surface of the water until a trawler comes along, which raises him and makes crew and boat captives, providing the crew is still alive. Sometimes they are under water for three days, held there by the destroyers to avoid a surface battle, at the expiration of which the trawler raises them, dumps out the crew and tows the submarine into port.

"In one harbor during 1916, 86 captive submarines were observed, heavily guarded, and although it would seem that at the rate of destruction and capture of these craft, the German Navy would rapidly become depleted of its U-boats, it has lately been reported that the Germans are able to construct new submarines at a faster rate than they are destroyed." —*Rudder,* June.

ITALY

PATROL BOATS AND THEIR ACTIVITIES.—The Italian Government has for some time been building patrol boats which are unlike any other boats used to chase submarines. These boats are 58 feet long, 9 feet beam, and are equipped with two 6.5-mm. Colt automatic rifles and one 4.7-mm. anti-aerial gun. Unlike the American or British types, the Italians have a bow curved similar to the fast racing craft of recent years. These boats are driven by Sterling engines, which have been shipped to Italy from the factory here. Recently at a dinner of the Sterling Bowling Club, Captain Good, late of the British Army, who is now consulting engineer for the Sterling-Sunbeam Airplane engine, and Mr. Flaherty, of the company's engineering force, told about the Italian boats and how he taught Italians to operate the Sterling engine. His method was to have one engine sawn in half longitudinally and every working part was thus easily explained to the students. Mr. Flaherty also in his remarks told of bombs used to destroy submarines and said in part:

"There are many processes of destruction peculiar to each government, a number of which have been kept secret; the Italian Navy, for instance, has had a secret for 15 years' standing, involving a torpedo which is towed from the stern of one of these boats and which will submerge at a rate proportionate to the speed of the boat, with the intent of its hitting the submarine.

"The average depth to which a submarine submerges is probably not over 150 feet, although the record is 320 feet. U-boats of the type being rapidly constructed by the German Government, are approximately 275 to 300 feet in length, and although immensely practical, it is within the province of the destroyer to exterminate them.

"There is a type of bomb greatly resembling a pail about 16 inches in diameter, 18 inches high, containing about 100 pounds of high explosives—T. N. T.—or ballinite. These bombs, sinking until the pressure at a certain depth causes a contact, explode with such a concussion as to render ineffective the chemicals of the submarine's batteries in a radius of 150 yards. Now if the submarine has her batteries destroyed, her electric engines cannot run, and she is compelled to expel the water from her compartments by air pressure and rise by virtual buoyancy to the surface in order to use

her Diesel engines. There she is an easy target for the anti-aerial gun which, by the way, has an effective range of 7 miles.

These boats are capable, by reason of their shallow draft, of traveling completely over a mine field, which is planted below the surface. With a certain appliance they reach down and cut the mine ropes, and as the mine floats to the surface, it is either taken in tow and planted at a point disadvantageous to the enemy, or is destroyed. It is said that some of these boats are also equipped with 18-inch torpedo tubes and 57-mm. anti-aerial guns. It is reported that a boat of this type captured one Danish and one Spanish steamer, which it is known had been supplying submarines with oil in the Mediterranean.

One method of destruction in connection with the aeroplane or balloon service, is for the destroyers to rush in a bunch to the spot where the submarine was last seen to sink; spreading out star-shaped, they continue to run and when the submarine comes to the surface, she must be between two of them, where, guided by the aeroplane or balloon, it is a simple matter for the chaser to run them down. Right here is where high-speed Sterling engines do their duty; traveling twice as fast as the submarine they rapidly overtake it and the bomb or torpedo comes into play. Frequently oil is sprayed on the water with the object of its accumulation in the eye of the periscope, so blinding the submarine.—*The Rudder,* June.

JAPAN

SHIPBUILDING ACTIVITIES.—On March 31 there were 132 steamers aggregating 650,950 tons under construction in Japan. Following was the work going on at the principal shipyards: Mitsu Bishi Shipyard, Nagasaki, nine steamers aggregating 54,000 tons; Mitsu Bishi Shipyard, Kobe, four steamers aggregating 18,600 tons; Kawasaki Dockyard, Kobe, 27 steamers aggregating 155,000 tons; Osaka Ironworks, Osaka, 22 steamers aggregating 14,500 tons; Osaka Ironworks, Innoshima, 13 steamers aggregating 67,700 tons; Uraga Dockyard, 15 steamers aggregating 84,000 tons; Fuzinagata Dockyard, eight steamers aggregating 15,000 tons; Ono Dockyard, three steamers aggregating 8300 tons. While a number of these ships are being built for Japanese owners many of them are being built "on spec." Japanese will not underbid the market, as is shown by the high prices asked in London. The Kawasaki Co. recently quoted £65 per ton deadweight ton. There are no restrictions on Japanese output, and building for foreign account is encouraged. Japan has been a big buyer of American ship steel, and has paid record prices. Before the war, steel was imported from England and Germany. The Japanese Government also gives a subsidy of $4 to $5 a ton on ships built in Japan.—*Shipping Illustrated,* 19/5.

We read in *The London and China Telegraph* that a large extension of equipment is projected by the Mitsu Bishi Dockyard and Engine Works at Kobe. This company is to build four steamers this year, ranging from 2000 tons to 6000 tons, while the construction of other vessels on its own account is also contemplated. To meet the increased demand for building capacity, the management has undertaken the construction of two new docks, and a new floating dock of 20,000 tons lifting capacity. It is said that when these projects are completed the Mitsu Bishi yard in Kobe will be able to build ships aggregating 60,000 tons a year. The new floating dock will be moored in the new basin as soon as the breakwater of about 1000 feet is completed. This breakwater will run from the end of Wada Point, nearly parallel with the existing inner breakwater of about the same length. A new engine shop is now being constructed with the intention of manufacturing Diesel engines for land and marine purposes, especially for submarine boats, together with petrol engines for aeroplanes, motor-boats and motor-cars. The new shop is expected to be finished by about the middle of this year. It has also been decided to commence the manufacture of the "Stal" type of steam turbine.—*Engineering,* 25/5.

MEXICO

A NEW MEXICAN PORT.—The Mexican Government has awarded a contract for the creation of a new deep water port of the bay of Esperitus Santos, coast of Quintana Roo, formerly Yucatan. It is said an ideal port can be created there, as it is almost completely landlocked and the depth of water will admit the largest ocean steamers. The opening of this port, it is predicted, will mean the development of a large area of eastern Mexico, heretofore little known.—*Marine Journal*, 9/6.

RUSSIA

PATROL BOATS.—One of the 60-foot patrol boats built for Russia by the Greenport Basin & Construction Company was officially tried on Gardiners Bay last month under the supervision of government officials. This boat is one of a fleet and the guaranteed speed is 29.5 knots. Forty-two boats of this model have been built. With the earlier ones the speed guaranteed was 26 miles an hour, but the power has been increased to give a higher speed. The boats are now equipped with two 8-cylinder, 6¾- by 7¾-inch Duesenberg engines.

These boats, which are designed by J. W. Hussey, are of the V-bottom type with the floor flattening out aft, so that they are in reality a huge monoplane. The principal dimensions are: 60 feet long, 10 feet breadth and 3 feet draft. The two big Duesenbergs are installed practically amidships with ample room for the mechanics. The speed of 29½ knots guaranteed by these boats has been exceeded in each instance. Each boat must be able to cruise at top speed for 300 miles with one filling of the tanks. Fuel is carried in four 270-gallon tanks placed just abaft of the engine room, giving a total capacity of 1080 gallons, which at the guaranteed speed, gives a cruising radius of approximately 500 miles, while at a lower speed 1000 miles can be covered on one filling.

The boats, painted a battleship grey, are very businesslike looking propositions, low, rakish and fast as a streak. Flush decked, with a small steering shelter just forward of amidships as protection for the helmsman and a small house skylight over engine room and the after stateroom. The hulls are subdivided by four water-tight steel bulkheads, two shutting off the engine room from the rest of the boat and an additional steel bulkhead aft going only halfway to the deck. Forward there is a good-sized cabin, affording accommodations for six men, an oilstove, toilet and lavatory. Aft is a smaller stateroom with the accommodations for the two officers, also the wireless table, chart table, chest of drawers, and an enclosed toilet room. Each boat is equipped with a powerful wireless set manufactured by Cutting & Washington, a very compact and efficient installation that has proven out well in service.

Eight new boats recently ordered by the Russian Government are to be 72 feet long, 11 feet 3 inches breadth and 3 feet 3 inches draft. Each boat is to be driven by three 8-cylinder, 6¾- by 7¾-inch Duesenberg 350-400-horsepower engines. Each carries an 18-inch torpedo tube amidships and a 47-mm. rapid-fire gun on the forward deck. The boats are controlled from the bridge deck with a sheltered cabin for the quartermaster, with controls from either the shelter or bridge deck. A speed of 28 knots is guaranteed.

Ample space has been provided for the crew and officers. The forepeak is arranged for chain lockers and bosun's gear lockers, followed by ship's galley, which has two pipe berths. Next to the galley is the officers' cabin and wireless room, which is entered by a hatch from the steering shelter. Next aft is the machinery space for the three Duesenberg engines, a 3 k.w. Universal lighting set, the necessary oil tanks, batteries and a work-bench. The next compartment contains fuel tanks with 1300 gallons capacity. Aft of this compartment is located the crew's quarters, berthing eight men. The hull is divided into six water-tight compartments by steel bulkheads.—*The Rudder*, June.

TRANSPORTATION OF COAL TO ARCHANGEL.—A striking account of how the Russian Government saved more than $6,000,000 on purchases of English coal during 1914 and 1915, by sidetracking the Russian coal middlemen who had squeezed hundreds of millions of dollars out of the Imperial Treasury in earlier years, is given at length in a recent issue of *Fairplay* (London). The article speaks with frank severity of the Russian coal combine, and gives figures and charts to show the exorbitant prices demanded by the middlemen and the much lower prices actually paid by the government after it began to buy direct from the English collieries, and to make its own charters of ships to carry the coal to Russia. On the point of the middlemen's monopoly, the article says:

"For years the Ministry of Marine (navy) as well as other large consumers of coals in Petrograd and surrounding districts, were compelled to purchase their coals from Petrograd middlemen, amongst whom a very important rôle was played by Hugo Stinnes, who formed in Russia a Russian company, and became the leader of the coal trade. He, more or less, organized a pooling system of all the important importers of coal in that district, and it was practically impossible for anybody to compete against them or for the consumers to buy direct. Purchasers were at the mercy of this 'ring,' who controlled not only the prices, but also the quality of the coals mined."

A plan for cutting far under the middlemen's prices, and for ensuring good quality of coals, was worked out by a representative of the Ministry of Marine in London, in connection with a commercial organization which carried out the detail work of loading coal bought direct from the English collieries, and shipping it in British and Russian ships chartered by the Ministry of Marine. This organization was R. Martens & Co., Ltd., of London, who have branches all over Russia, in England and also in New York and Paris. A firm of English chartered accountants was given supervision of all the records of all the transactions on account of the Ministry of Marine, through R. Martens & Co., and the article in *Fairplay* gives numerous tables and graphs which show the middlemen's bids, the much lower actual cost under the new system of direct purchase and government chartering of ships, and the savings on certain large groups of coal shipments on the basis of the middlemen's prices.

On 763,911 tons of coal shipped to Archangel during 1914, the saving to the Russian Government amounted to £1,303,969 8s. 4d., or approximately $6,150,000. The Ministry of Marine paid 23s. 5d. for this coal, or an average c. i. f. cost of 47s. 3d. for coal shipped in Russian vessels (which receive a shilling per ton higher freight than foreign ships); and an average c. i. f. cost of 43s. 6d. for coal shipped in British bottoms; against the middlemen's bid of 77s. 6d. c. i. f.

On coal shipped to the authorities of the port of Archangel during 1915, the saving by the new method was 30s. 9d. per ton over the middlemen's price of 77s. 6d. per ton. The record ends with 1915 because the growing scarcity of tonnage, and government control of nearly all tonnage under requisition or charter made commercial initiative practically out of the question.—*Shipping Illustrated*, 2/6.

SPAIN

COAL SHORTAGE.—A cablegram has been received from the American Ambassador at Madrid, Spain, dated June 5, 1917, the substance of which is as follows:

"There is a scarcity of coal in Spain, and unless foreign ships agree to carry cargo to or take cargo from Spain no coal will be given them. American ship owners should be warned to this effect.—WILLARD."

—*Official Bulletin*, 11/6.

UNITED STATES

CONSTRUCTION.—Representatives of 12 shipbuilding concerns conferred with the Secretary of the Navy on May 21 regarding the possibility of speeding the construction of 24 combination mine sweepers and sea-going tugs, reported to be destined for use in a most important venture abroad. The Secretary assured his conferees that the government would co-operate with them to the extent of guaranteeing labor and material, and by expediting the shipment of the latter necessity. Following the conference with Mr. Daniels the visitors consulted Rear Admiral Robert S. Griffin and Chief Constructor David W. Taylor, U. S. Navy, with regard to the plans from which the ships are to be built. The question of skilled labor was the only impediment to quick delivery in the opinion of the shipbuilders. Of 1000 tons each, the mine sweepers are to be unusually stout boats, capable of overseas duty if it should be decided to use them to co-operate with the allied auxiliary fleets.

Secretary Daniels announced later that the contracts for the mine sweepers would be distributed among the 12 firms, deliveries to begin within six months. "They will be built on the cost-plus-percentage basis," said Mr. Daniels, "at a profit to the builders of 10 per cent above actual cost. The firms and companies which will take these contracts are not at present engaged on government work, so other naval construction will not be affected."

Mr. Daniels stated on the same day that the Navy Department had given out contracts or completed arrangements for practically the entire building program authorized, with the exception of three dreadnoughts and some auxiliary craft. Contracts for 38 submarines of the 800-ton type were let as follows: Electric Boat Co., New London, Conn., 24; Lake Torpedo Co., four, all on cost-plus-percentage basis; and Portsmouth Navy Yard, 10. The number of mine sweepers to be allotted each company will be determined after a thorough investigation is made to see whether important contracts now under way will be effected at the yards involved.—*Army and Navy Journal*, 26/5.

The Navy Department announces that in addition to building contracts made early in the week, another contract has been let to the Newport News Shipbuilding and Drydock Company for four destroyers of the latest type. High speed is promised for these craft, and it is expected that new records for construction will have been established when they are launched.—*Army and Navy Register*, 26/5.

"AMPHITRITE-MANCHURIA" COLLISION.—The steamship *Manchuria* was severely damaged in a collision with the United States monitor *Amphitrite*, on guard duty, as she was passing Quarantine in a heavy fog last night (June 13-14). With two big holes in her port side amidships and down by the stern, it was feared it would be necessary to beach the steamship, but she was able to return to her pier under her own power.

Steaming slowly through the narrows because of the fog, the *Manchuria* bumped into the little monitor. The larger vessel's stern rested squarely on the monitor's bow. A patrol boat and a tug dragged the monitor loose, little damaged. The *Munchuria* was not so fortunate. She was shipping water rapidly and had a bad list. It was decided, however, that she would be able to reach her pier.

The *Manchuria*, of 13,638 tons, is owned by the International Mercantile Marine.—*N. Y. Herald*, 14/6.

SUBMARINE LAUNCHED.—The submarine *N-7* was launched May 19, at the Lake Torpedo-Boat Company's yard in Bridgeport, Conn.—*Army and Navy Register*, 26/5.

SUBMARINES DESIGNATED.—By order of the Secretary of the Navy the submarines now authorized and not otherwise designated, with exception of *No. 108*, are designated as follows: *Nos. 78* to *104* (500-ton boats) are assigned the letter *R*. Submarines *105-6-7-9* and *146* (800-ton) are assigned the letter *S*. The numbers in the *R* class will run from 1 to 27, inclusive, and in the *S* class from 1 to 41, inclusive. *No. 108* is the submarine of the Neff type authorized in the 1917 program.—*Army and Navy Journal*, 26/5.

VESSELS TRANSFERRED.—The U. S. Bureau of Fisheries' steamer *Halcyon* has been transferred to the navy, for use in the coast-patrol service. She is a wooden-hull, single-screw, steam-propelled vessel, 100 feet 6 inches in length, 10-foot draft, and developed 10 knots on her acceptance trial.—*Shipping Illustrated*, 26/5.

Secretary Daniels announced that the names of the seized German ships assigned to the navy have been changed as follows:

Geier to *Schurz; Breslau* to *Bridgeport; Kiel* to *Camden; Liebenfels* to *Houston; Saxonia* to *Savannah; Vogensen* to *Quincy; Nicaria* to *Pensacola; Odenwald* to *Newport News; Hohenfelde* to *Long Beach; Frieda Leonhardt* to *Astoria; Andromeda* to *Bath; Rudolf Blumberg* to *Beaufort; Praesident* to *Kittery*, and *Locksum* to *Gulfport*.

Most of the names of the new vessels are of coast towns and cities, which have some connection with the navy. The *Geier*, the gunboat interned in Honolulu, is renamed for *Carl Schurz*, the famous German-American general and editor.

The *Liebenfels*, now the *Houston*, was sunk in Charleston harbor when the United States broke off relations with Germany.—*Army and Navy Register*, 9/6.

ANXIETY OVER NAVY CONSTRUCTION.—The naval authorities will probably have to come to some understanding with the shipping board if it shall prove there is any ground for the prevailing apprehension on the part of the officials of the Navy Department that the shipping board's project for the construction of steel ships shall prove an interference with the completion of the naval building program, work on which under contract at private plants is being expedited on account of the war. When it was announced that the shipping board, or at least General Goethals, was in favor of the construction of ships of steel instead of wooden vessels, it was appreciated in the Navy Department that there might be some occasion for anxiety in regard to the completion of naval vessels of various types within the period regarded as eminently necessary. It does not appear to be definitely known to the naval authorities exactly what is contemplated in the way of steel-ship building under the auspices of the shipping board, but if anything like 3,000,000 tons or even as much as 2,000,000 tons is intended to be realized within a year, it can only be achieved by a subordination of new naval construction, which is estimated as not exceeding 200,000 tons in a year. The existing capacity of the plants now in operation does not exceed 1,250,000 tons, and none of the plants are running to full capacity because of the lack of trained labor. It will be something of a problem, say the naval experts, to obtain anything above the possible product of the private yards now in operation. When it comes to an interference with the naval building program, there is likely to be a spirited protest on the part of those who are responsible for completing naval vessels within the period already prescribed. About the only opportunity for reduction in that direction would be in the case of five battle cruisers, but, inasmuch as the aggregate tonnage of 150,000 is distributed over a period of three years, it is appreciated that the advantage gained for the shipping-board program would not be compensated by the delay in the construction of this type of naval vessel. The same rule would apply to the 50 destroyers with their total tonnage of 50,000. It is insisted in the Navy Department

that whatever is done in the way of building steel ships for merchant use, there should be no block to the building of naval vessels, which may happen if the shipping-board program is carried out to the exclusion of naval needs. The situation is one which finds it possible for the shipping board to obtain the material without detriment to the naval building program, but the difficulty will be, as it has been all along, in obtaining the labor qualified to do the work.—*Army and Navy Register*, 9/6.

U. S. S. "AMMEN" DAMAGED.—The destroyer *Ammen* put into the Boston Navy Yard June 3, the Navy Department announces, with a slightly damaged bow as a result of a collision with the American freight steamship *Frasch* in a fog off Nantucket Lightship early Saturday morning, June 2. No report of the damage to the *Frasch*, a 2300-ton vessel, was received here.—*N. Y. Herald*, 4/6.

PATROL BOATS.—The submarine chaser building program is more than a month ahead of schedule. The Navy Department announced that nearly three times the expected number of 110-foot chasers will be delivered by August 1, according to present indications, and that all of the large number of boats ordered are actually under construction.—*N. Y. Herald*, 15/6.

CHARTERING PATROL VESSELS.—In connection with the quiet campaign of preparedness which is being carried on under the orders of Franklin D. Roosevelt, Assistant Secretary of the Navy, and about which there has been no previous public announcement, an active effort has been under way during the last month to procure sea-going yachts for immediate war duty. Vessels of this kind must be not under 110 feet in length, with sea-going ability and of large cruising radius. The governnment will employ a large number of such vessels as auxiliaries to the other fighting units of the navy, and the patriotic spirit of many owners who have already come forward to turn over their vessels for this valuable service is worthy of commendation. Not only from ports on the Atlantic Coast, but from various points on the Great Lakes, a fleet is being rapidly mobilized and a number of fine yachts, now in process of alteration, will very shortly be added to the fleet of the navy. About a month ago the Assistant Secretary of the Navy organized a Special Board for Patrol Vessels, whose duty is to secure suitable boats with all possible dispatch. One of the first moves of this board was to have the International Mercantile Marine Co., 9 Broadway, New York City, designated as the official agents of the special board. This brings to the assistance of the navy in these times of stress the services of the International Mercantile Marine Co.'s large staff of shipping experts, all of whom are giving their services without remuneration. The navy yards, in their present crowded condition, are thus relieved of a great deal of work, and under this new arrangement owners also are assured of immediate payment for their boats, dispensing with the time-consuming formalities which ordinarily are followed in dealing with the government departments. The International Mercantile Marine Co. is also supervising all alterations above and below decks, arming, outfitting, coaling and provisioning the ships and delivering them, painted in war colors, to the Navy Department for sea duty. The Special Board for Patrol Vessels is acting in an advisory capacity and is preparing to man all these ships promptly.—*Shipping Illustrated*, 26/5.

NAVAL BASE AT HAMPTON ROADS.—The President has been empowered to take over for the United States the immediate possession and title to the tract of land known as the Jamestown Exposition site, on Hampton Roads, Va., and certain adjacent lands which were included in the proposed purchase, under the Senate amendment to the deficiency army and navy appropriation bill, for $1,400,000 and which is to be used as a naval operating base. The amount of the purchase price has been reduced to $1,200,000,

and the sum of $1,600,000 is provided for equipment of the base, including piers, storehouses, oil-fuel storage, training station, and recreation grounds.—*Army and Navy Register,* 16/6.

FOURTEEN TUGS NECESSARY TO SHIFT CAPTURED LINER.—The North German liner *Kaiser Wilhelm II,* one of the fastest of the German vessels seized by the United States after the declaration of the war against Germany, was moved on May 22 from Hoboken to the New York Navy Yard to fit her out for service. It took 14 tugs to pull, push and guide her down the North River, around the Battery and up the East River to the yard.—*Army and Navy Journal,* 26/5.

BOSTON DRY DOCK.—The chief of the Bureau of Yards and Docks has been able to materially assist in the construction of the commonwealth dry dock at Boston, which structure was threatened at one time with abandonment. The chief of the Bureau of Yards and Docks has arranged with the Worthington Pump Company for furnishing the Boston dock with its pumping plant, that concern having received the contract from the bureau for furnishing the pumping plant of the naval docks at the Norfolk and Philadelphia Navy Yards. In other words, the contractors will furnish three standard plants of practically identical design with certain necessary minor modifications to fit the conditions of the Boston structure. In the same way the bureau chief has arranged for the supply of steel for the Boston dock, which, it is expected, will be completed in two years. Satisfactory progress is being made on the naval docks at Norfolk and Philadelphia, that at the former establishment being finished, according to present indications, in about a year or within 18 months from the time of the commencement of the work.—*Army and Navy Register,* 9/6.

ORDNANCE AND GUNNERY

EXPLOSIONS ABOARD LINERS.—An American steamship which left port on May 19 returned May 21 bearing the bodies of two Red Cross nurses who were killed by the explosion of a shell during target practice.

According to ordnance experts, had the propelling charge been perfect the projectile would have left the muzzle of the gun travelling at the rate of at least 2600 feet a second. If the bursting charge had been detonated immediately after the shell left the gun the momentum of the fragments of the projectile could not have been overcome, and instead of coming back to the ship they would have scattered in a wide, fan-shaped burst.

Major Frederick Besley, civilian commander of the Red Cross unit and a professor of surgery at Northwestern University, said:

"Target practice was begun on board the vessel at two o'clock on May 20. All the nurses were on the upper deck, amidships. The chief officer and I were standing with the nurses and we were all leaning over the rail watching the shots from the gun deck below. Two shots had been fired from a forward gun. Then word came that a gun was to be fired on our side of the ship.

"We were at right angles to the course of the shell. There is no accurate evidence to warrant making a positive statement as to the exact cause of the accident.

"All statements made were taken down in affidavit form. We found pieces of copper in the wounds inflicted upon the three nurses and other pieces upon the deck. The gun was not injured and the gun crew did not know about the accident until told by the officer in charge."—*N. Y. Herald,* 22/5.

Old shells manufactured in 1898 for use in the Spanish war were responsible for the premature explosions on the American Line steamships *St. Louis* and *St. Paul.*

The statement of the Navy Department was embodied in the form of a report made to Secretary Daniels by Rear Admiral Ralph Earle, Chief of the Bureau of Ordnance, who had been instructed by Mr. Daniels to furnish an account of what had occurred on the *St. Louis*, the *St. Paul* and the *Mongolia*.

The report of Rear Admiral Earle follows:

"Acting in accordance with your verbal instructions, the following report is submitted relative to the defective performance of certain ordnance material recently placed on board armed liners.

"The first American liner to be armed was the S. S. *Manchuria*, on March 10, 1917. The arming of other large liners followed immediately. The guns used were of the best type known at the present date, and were nearly all absolutely new, having been fired but the rounds necessary to test them for strength before permitting them to be used with service charges.

"The ammunition for these guns was assembled according to standard methods in December, 1916. The usual thorough tests of all this ammunition were made at the Naval Proving Ground, and all tests resulted in perfect performances.

"The armed liner *St. Louis* on her first trip to Liverpool, where she arrived about March 26, 1917, fired 45 service shells at an iceberg for a target. This firing was held in accordance with the instructions of the bureau in order to test the mounts, guns, ammunition, and to train the gun's crew. Several shells burst prematurely, some inside the bore of the guns, others before striking the target. The damage to the bore of the guns caused thereby was sufficient to necessitate their being relined.

"Upon her return to New York the guns and shells were immediately removed and new guns, with a new supply of shells issued to the ship. Later on, one other shell exploded prematurely, as well as one of the same caliber on both the *Mongolia* and the *St. Paul*. In none of these cases was the gun damaged beyond remedy by relining, which relining has been done.

"The development of modern ordnance has been extremely rapid, and the comparative freedom of our navy from serious accidents in connection therewith has been a source of satisfaction to the service, but mishaps with ordnance material cannot be absolutely prevented.

"It is necessary in all work on explosives to draw deductions from the actual tests made at the proving ground. However, it must be borne in mind that material used as an explosive is designed to spend all of its force in an instant space of time, and cannot be relied upon with absolute certainty to give the same result in all cases. An example of this is well shown by the subsequent action of the supposedly defective ammunition taken from the steamships *St. Louis* and *Mongolia*. Eighty-nine rounds of this ammunition were fired at the proving ground immediately following the premature bursts, in an effort to develop a reason for such incidents. These rounds were fired, nearly all, at higher chamber pressures than were the service rounds fired on board these vessels. In 87 rounds, both the shell and the fuses functioned perfectly. One shell broke up, investigation showing that it had been made prior to 1900, but had been accepted as a suitable 6-inch shell, and the second one was a shell that had been examined prior to firing and found to have been a little thinner walled than the latest design in use.

"The conclusion reached is that all 6-inch shells and fuses manufactured since the year 1900 are satisfactory, and that the premature bursts so unfortunately occurring on our armed liners may be attributed to shells made prior to 1900, and made possibly with slightly thinner walls than the latest type of shells.

"On the return of the *St. Louis* from her first trip, about April 9, 1917, all such shells were removed, and no such shells are afloat now on armed liners. This procedure was also adopted at once in the case of all 6-inch ammunition for vessels of the navy.

"Prior to this happening the Bureau of Ordnance had every reason to expect that every shell in its magazines of 6-inch caliber was a satisfactory shell."—*N. Y. Herald.*

SENATORIAL INVESTIGATION.—Rear Admiral Earle, Chief of the Naval Ordnance Bureau, disclosed to the Senate Naval Affairs Committee, June 2, that a defect in shells was responsible for the accident aboard the *Mongolia,* and also for the premature explosions aboard the *St. Paul* and *St. Louis.* The trouble, he explained, was that the brass mouth cups at the base of the shells were driven with such force as to crack the shells and in that way cause premature explosion.

This defect, Admiral Earle informed the Senate Committee at its investigation into the *Mongolia* incident, had already been corrected, and no more brass mouth cups are now used by the navy. Light wooden cups have been substituted, Admiral Earle said, and there was no longer any danger of premature explosion from defective cups.

Rear Admiral Earle frankly stated to the committee that not until two days ago had the navy been able to discover exactly what had caused the premature explosion aboard the *St. Paul* and *St. Louis,* or to what to attribute the *Mongolia's* accident. It was not until the navy's gunners had target practice with the same sort of shells with the brass cups, at the Indian Head Ordnance Proving Grounds, he said, that the real trouble was disclosed.

"We started trying to ascertain what the difficulty was immediately after we learned that there must be some defect in the shells," explained Admiral Earle. "We tried different sorts of shells and the majority of them were all right. We found that the trouble was confined to the 6-inch shells and, eventually, that it was the brass cup that was responsible. The cup, we found, was driven with such force at the time of firing that it cracked the wall of the shell and allowed fumes from the cartridge to enter the shell and explode it."

"We are now able to assure the committee that no such accidents can occur in future," said Admiral Earle. "We already had been using wooden discs on most of our shells. We are going to substitute *papier-mache* discs as fast as we can. They are even more practicable. The wooden disc is pulverized or burned in the discharge of a shell. The paper disc is even more brittle."

A report was read from Captain MacDougall, American Naval Attaché at the London Embassy, in which he said that out of 45 shells fired from the guns of the *St. Louis* on one of her trips four had exploded within 100 feet of the vessel, nine inside the guns, and that none exploded when it hit the target at which the gunners fired.

"That is not so," said Admiral Earle. "We have investigated the explosion of shells on all the ships. Captain MacDougall has been misinformed."

"It is wrong to expect merchant ships to go out with shells that are liable to prematurely explode," interposed Senator Poindexter. "I fail to see why the navy did not see that only perfect shells were put aboard the ships."

Admiral Earle insisted that every effort to supply perfect shells had been made and that the fault in the brass-cupped shells was not known when the merchantmen were equipped. Not all the merchantmen, however, had that character of shell.

Asked by Senator Penrose to tell precisely what had caused the accident aboard the *Mongolia,* Admiral Earle explained:

"In the firing of a shell the rifling of the gun gave the brass mouth cup a rotary motion, as it was driven at high velocity into space. Following the laws governing a revolving disc, it acted like a boomerang after leaving the gun and returned to the deck of the ship killing the two nurses who were sitting in deck chairs."

Admiral Earle said that all the premature shell explosions had been confined to the 6-inch guns using the brass cup. Out of 45 shots at target practice on the *St. Louis,* he said, nine shells exploded in the chamber of the guns and four within 100 yards of the muzzle. Two shells on the *St. Paul* exploded prematurely and two on the *Philadelphia.* Being concerned as to the cause of the explosions the Navy Department conducted its tests at the Indian Head Proving Grounds.

"We made many other tests in an attempt to reproduce the exact conditions under which the shells on the *St. Louis* had prematurely exploded," said the admiral. "But we had no success until May 31. Then four shells with the brass cup exploded in the chamber of the gun, or at its muzzle, out of 16 shots fired."

In reply to questions of Senators Frelinghuysen and Poindexter, the admiral stated that the English, Japanese and German navies use zinc caps, but they, also, at times had premature explosions. Extreme difficulty existed in getting a navy shell that could be regarded as absolutely perfect.

"We now think that with the abandonment of the brass cup we have solved the problem," said Admiral Earle.

The 6-inch guns aboard the 200 merchantmen which the navy had armed, Admiral Earle said, were of modern type and regarded as perfect.—*N. Y. Times, 3/6.*

MUNITIONS.—Frank A. Scott, Chairman of the General Munitions Board of the Council of National Defence, has issued the following statement:

"We are in a position now to assure the country that rifles and ammunition will be ready for American troops as fast as they can be raised and otherwise prepared for foreign service. There are on hand more than enough rifles for the rifle-carrying men of an army of approximately a million, and arrangements have now been made to provide for the arming of a larger force and for the reserve which the wastage under modern war conditions makes necessary. Plans have been completed to take advantage of the small arms factories developed in our country as the result of the European war and convert them to our use. In addition, the government arsenals are being expanded. In general, it may be stated that small arms, including ammunition, can be provided for practically any number of men that the country may call to the colors.

"Manufacturing facilities for the Springfield rifle are not adequate to supply the number required for the larger force which the United States may decide to send abroad and to replace the wastage of such a force. Fortunately, the existing small arms factories which have been turning out quantities of rifles for the British Army are equipped to manufacture the Enfield rifle in more than sufficient number. Therefore, it has been decided to adopt the Enfield rifle, but manufactured to use American ammunition, and to issue these rifles to our troops to such extent as may be necessary. Our government will continue to manufacture the Springfield model, the ammunition for which will be interchangeable with that of the new Enfield.

"The United States is in a very satisfactory position so far as all types of ammunition are concerned. This country has developed during the past three years great plants for the manufacture of high explosives, small arms ammunition and field artillery ammunition of various types.

"Steps are being taken to provide for the additional quantities of field artillery necessary for modern battle conditions through the extension of plants already in operation for the Allies, and through the introduction and adaptation of new plants that have not hitherto manufactured war material. . . . .

"In order to secure the great quantities of artillery immediately necessary for the large armies that are to be raised, a certain number of guns of tried foreign types, but manufactured in the United States, will be

introduced into our service. Satisfactory arrangements have been made to accomplish this. In the meantime the munitions plants are pushing forward their preparations for the manufacture in large quantities of the various types of mobile artillery that have been adopted for our own service. . . . "

The board has not authority to issue purchase orders, make contracts or bind the government in its purchases. All these functions are performed, as heretofore, by the several departments. The chairman of the board, however, has authority to require, when necessary, that conflicting purchases be not made until they have been submitted to the Secretary of War or the Secretary of the Navy, as the case may be, with a full statement of the facts. Broadly stated, it is the function of the board to ascertain the needs of the departments and exercise general advisory supervision over the terms of the contracts, with a view to establishing a general purchasing policy for the military arms of the government as a whole.—*Army and Navy Register*, 19/5.

ORDER FOR RIFLES TO BE PLACED.—The Winchester Repeating Arms Company will receive from the government an order for 225,000 rifles, 280,000,000 cartridges and many thousands of ordnance cases. The company's profit on the order will not be greater than 10 per cent. The rifles will be of the modified Enfield type.—*N. Y. Herald*, 14/6.

NAVIGATION

OPENING HELL GATE.—Now that it has become a military necessity, Hell Gate is to be made over into something less deserving of the name and much more useful to commerce and civilization. Since 1851 there have been periodic attempts to cure it of its evil habits, but this time, if Congress makes the necessary appropriation, it will be successful and permanent. The Gate is needed by warships as a secondary approach to the Brooklyn Navy Yard. It must be deepened, widened, and otherwise amended, and in being thus amended to accommodate fighting craft it will itself become more peaceful and amenable to the needs of water-borne traffic and the port.

The problem, although ancient, is not difficult, say those who have given it study. R. A. C. Smith, Dock Commissioner, who has been conferring on the matter with members of the Rivers and Harbors Committee of Congress and the government engineers, would solve it by straightening the "elbow" formed by the East River as it rushes through the Gate. To do this he would slice off a bit of Ward's Island, cut off the tip of Astoria Peninsula, and remove some of the obstructions in the way of navigation. He is very much in earnest about the need of improving Hell Gate, having studied the problem for more than 40 years, and he added that Congress should lose no time in starting the work.

"If the war has done nothing else," he said, "it has emphasized the danger of continuing the neglect of the back door of New York Harbor furnished by the East River. The Federal Government, by the building of the splendid Ambrose Channel, has provided adequately for the ocean entrance, but by continued failure to appropriate the relatively small amount necessary for the East River improvement it has left the entrance to the sound completely bottled up so far as the largest commercial ships are concerned, and has made it impossible for the ships of the navy to use the channel.

"There is at present a channel only 26 feet deep through the East River, and there are a number of reefs and shoals which make operation by deep-draft vessels dangerous or impossible. Fortunately, there seems to be a growing appreciation on the part of the federal officials of the need of immediate appropriation for so much of the East River improvement as involves necessary changes at Hell Gate. This narrow strait is blocked

by a reef known as Pot Rock, and navigation is made difficult because of tidal conditions brought about in large measure through the tortuous channel.

"The government should make 40 feet through Hell Gate as quickly as funds can be provided. At the same time the channel should be straightened by the removal of a small section of the southeasterly corner of Ward's Island, and, possibly, by the removal of a portion of the extreme westerly edge of the Astoria Peninsula. The Ward's Island portion belongs partly, and perhaps wholly, to the city of New York, and would cost little or nothing for land purchase; the excavation offers no engineering difficulties. This improvement would remove the present right angle turn from Hell Gate into the main channel.

"If Hell Gate could be improved as suggested and certain minor betterments made in the lower East River, the ships of the navy would have an

COURSE OF WIDER HELL GATE CHANNEL

adequate entrance through Long Island Sound to the port of New York and to the Brooklyn Navy Yard."

Under the Dock Commissioner's plan, about 500 feet of Ward's Island known as Negro Point would be cut off to widen the channel. This would include about 300 feet of the upland. On the other side, about 200 feet of the Astoria Peninsula would be excavated. The deepening of the channel itself would not be difficult, it is explained, because the sides and bottom of the strait are ordinary Manhattan trap rock, which is easy to blast and would present few engineering difficulties greater than are encountered in digging a section of subway. Several holes would be drilled in the bed of the strait, or in Pot Rock, Hog's Back, or any of the other islands or rocks with picturesque names; these would be filled in with dynamite, and set off together, much as blasts are set off in the new subways. In order to keep the channel open for navigation, it would not be deepened until after it had been widened sufficiently to enable ships to pass on one side or other of the spot where the blasting was going on.

The speed with which the work could be done would depend to some extent on the amount of money provided. If the appropriation were large

enough to permit the work to proceed steadily, a year and a half would see a new Hell Gate with a channel deep enough to accommodate fighting ships of deepest draft. If held up from time to time by lack of funds, the work would, of course, take longer and the usefulness of the Gate in the war be limited.

It is estimated that an immediate appropriation of about $7,000,000 would enable the government to improve Hell Gate Channel sufficiently to care for battleships and for merchant vessels with a draft of 40 feet. There is every indication that the money will be forthcoming, because both Secretary of War Baker and Secretary of the Navy Daniels have seen the need of improving the Gate and have recommended the work.—*N. Y. Times*, 3/6.

SHIP LIGHTS.—The following order, dated May 22, has been issued by the British Admiralty:

"1. *Anchor Lights.*—No electrically-lit lanterns are to be employed as anchor lights. The normal brilliancy of all anchor lanterns is to be reduced by 50 per cent.

"All anchor lanterns are to be fitted with overhead screens, so arranged as to cut off the light at an angle of between 20 and 25 degrees above the horizontal.

"NOTE.—Specimen screens can be viewed at the Board of Trade Surveyors' offices at Leith, North Shields, Hull, London, Plymouth, Cardiff, Liverpool, Glasgow and Dublin.

"2. *Bow and Masthead Steaming Lights.*—Vessels in estuaries, harbors, anchorages and channels, where navigation in the dark hours is permitted, are not to employ electrically-lit lanterns as bow or steaming lights, with the exception of those vessels especially mentioned in paragraph 5.

"3. *Other Lights.*—No light, either aloft, on deck or below, except those authorized by the Admiralty confidential instructions, and such as may be necessary for authorized signaling purposes, are to be permitted to be visible from outboard. This applies to vessels whether under way or at anchor.

"4. The above order applies to vessels of every description other than His Majesty's ships, and the vessels mentioned in the succeeding paragraph, in the waters of the United Kingdom.

"5. Vessels carrying volatile oil or spirits in bulk are, notwithstanding the above order, to exhibit (in lieu of oil lamps) electrically-lit lanterns not exceeding in brilliancy 50 per cent of the brilliancy of the normal oil lamps.

"The Admiralty order as to ships' lights dated 14th October, 1916, is hereby cancelled."—*Shipping Illustrated*, 16/6.

COURSE FOR SHIPS ENTERING WAR ZONE.—The following circular letter has been sent by George Uhler, Supervising Inspector-General, Steamboat Inspection Service, to licensed masters and officers of merchant vessels of the United States entering the war zone:

"The department has had under serious consideration the very important proposition of the necessity of adopting and using every means and method to avoid, so far as may be possible, the attack of the submarine, and to this end it is suggested that when in the war zone or within dangerous areas during the night, all lights that can possibly be dispensed with, including the signal lights, should be extinguished, and such precautions adopted as will effectively blind every light on board to the observation of the enemy.

"There is offered for your serious consideration the suggestion also that regular or set courses should not be maintained, and that zigzag navigation be adopted whenever the conditions of the weather and the position of the ship will justify such deviation from established practices of navigation.

"Upon those ships which are armed, and the armament under the authority of an officer of the U. S. Navy, it is requested that serious consideration be given any suggestion from the naval officer on board respect-

ing the navigation of the ship, and his suggestion adopted unless in the opinion and judgment of the master it can not be safely done.

"Licensed masters and other officers are assured that the department will not attack their licenses for any collision or other accident that may result from the adoption of these suggestions respecting irregular navigation while in the war zone or within suspected dangerous areas, as the paramount desire is that every and all precautions be taken against submarine attack, and anything that may result from such precautions will be considered as the lesser of the two dangers."—*Shipping Illustrated*, 2/6.

ENGINEERING

LARGEST AMERICAN MARINE DIESEL ENGINE INSTALLATION PROVES SUCCESSFUL.—The largest Diesel engined motorship so far built in the United States is the twin-screw naval collier *Maumee*, of 14,500 tons displacement, propelled by two single-acting, two-cycle Diesel engines of 2600 shaft horsepower each. The engines were built by the machinery division of the New York Navy Yard, Brooklyn, N. Y., in accordance with original designs secured from the Machinen Fabrik Augsberg, Nurnberg, Germany, through the New London Ship & Engine Company, Groton, Conn. Each set of engines has six cylinders with a diameter of 25.2 inches and a stroke of 37.37 inches. At a normal speed of 130 revolutions per minute the engines are designed to give the ship a speed of 14 knots.

Since the *Maumee* was completed last December the vessel has been in active service for five months, and during that time has made 18,000 miles without a hitch. The engines have proved very satisfactory in service, and have been ready to respond to any emergency. The only defect that has developed has been the cracking of some of the cylinder jackets, which is apparently due to lack of sufficient clearance between working liners and jackets. It is thought that additional clearance can readily be allowed and that when this is done the engines will be ready for any service.

The fuel economy is excellent, the consumption being less than one-half that required for the most economical steam plants. Ordinary navy fuel oil is used. The consumption is about .5 pound of oil per shaft horsepower for all purposes.

The engines handle very well, and as the *Maumee* is a vessel engaged in service that requires repeated going alongside of vessels, docks, etc., the handling requirements are particularly severe.

The overhaul and upkeep requirements have been very meager, and but for the cracked castings have been attended to for five months' continuous running by the ship's facilities. The cost of the upkeep is apparently considerably less than for a steam plant of the same power and similar service. Less operating personnel is also required.

The weight of the installation is about the same as for a triple-expansion reciprocating steam plant, but, owing to the fuel economy, about 7 per cent additional cargo-carrying capacity is available.

The actual performance of the *Maumee's* engines has demonstrated that large Diesel engines present fewer difficulties in service than do small or medium installations, and there are no apparent reasons why the power per cylinder on the *Maumee* (about 500 horsepower) should not be doubled with entire success. This indicates that Diesel engines of 5000 horsepower per engine are an entirely feasible proposition.

For cargo boats operating in localities where fuel oil is available, the Diesel engine admittedly has great advantages. The extra first cost can very likely be made up in the first year's operation. Certain special advantages of the Diesel installation may be mentioned, as follows:

(a) The engine is ready to move in a few minutes.

(b) Full power either ahead or backing is available any time.

(c) No smoke or cinders, hence extreme cleanliness can easily be maintained (a particular advantage for passenger ships).
(d) Regulation of speed is much easier and certain.
(e) All stand-by losses are eliminated. Fuel consumption begins and ceases with the movement of the engines.—*International Marine Engineering*, June.

HEAVY OIL ENGINES NOT TO BE USED.—It is definitely stated that heavy oil engines will not be used in the ships to be built for the U. S. Shipping Board. The output of heavy oil engines in the United States is small in comparison with the demand. The steam engines and boilers for the new ships will not be restricted to any particular type.—*Shipping Illustrated*, 16/6.

LOSS OF THE MOTORSHIP "SEBASTIAN."—The following letter appeared in the *Shipping Illustrated*, May 26:

"After a most successful career since her conversion to four-cycle Diesel power, the British oil tank motorship *Sebastian* was, as mentioned in your last issue, destroyed by fire and sunk in 200 feet of water off Nantucket Shoals while en route for Europe. Under no circumstances should this accident be used for the purpose of derogatory argument against the construction and use of Diesel motorships, for manifestly a motorship using crude-oil fuel without the use of exposed flame is far more safe and free of fire danger than is an oil-fired steamer.

"Since the war many Allied steamships have had mysterious fires while lying in American harbors, or shortly after leaving port, and likewise the recent burning of the tanker *Sebastian* is surrounded in mystery; but certainly the fire cannot have been due to the Diesel principle. The matter, however, is most regrettable, particularly as she has been a most successful vessel since her conversion, she having had no engine repair-bill.

"The writer has made every effort to secure an absolutely impartial report and has had interviews with both the chief engineer and the captain. It appears that the chief engineer, when in his cabin, noticed by the sound that one of the engines had stopped and that the other was slowing down. So he quickly went down below, and noticed that the fuel-oil had started to overflow from the filter, which is mounted on a grating over the engines, and the fuel-supply bottles that are suspended on a balance, had run dry (probably due to a chokage between the filter and the reservoir supply-bottles). The fuel-supply bottles running dry, of course, stopped and slowed down the engines respectively. Suddenly there was a tremendous flash of flame and the entire engine-room was on fire, the fire instantly spreading across in a big blaze.

"Now, the engine exhaust-pipes and the short extensions to each cylinder-head were lagged with asbestos, with the exception of three expansion joints on the exhaust-pipes and the flanges connecting the extensions to the cylinders.

"This fully indicates that the fire had absolutely nothing to do with the Diesel engines, because the exhaust temperature could not possibly have been sufficiently hot to ignite fuel-oil, and nowhere could there have been an exposed flame from the engines. To the writer it seems that there must have been some enemy plot that was arranged either before the ship left port or while the ship was at sea. Probably some highly inflammable chemical or gasoline was mixed with the fuel-oil before or after it was put in the bunkers. That the fire should have extended all over the engine-room adds to the mystery.

"The mean temperature of the exhaust gases of the *Sebastian's* engines under normal full-load conditions is about 700° F., whereas when the accident occurred one engine had stopped owing to a stoppage of the fuel supply, and the other had slowed down, so that the exhaust-gas

temperature must have been very low when the fire started. There was no electrical sparking device on the engines to start a fire.

"Mr. Arthur West, chief engineer, of the Bethlehem Steel Co., has since made some tests with a high-powered gas engine at their works. While the engine was running at a big overload and with high exhaust-temperature, fuel-oil of 33° Baume at 75° F. (solar-oil was the residual fuel used by the *Sebastian*) was poured over the naked uncooled exhaust-pipe, close to the cylinders; but under no circumstances could they produce a flame—just a smoke, that's all! Kerosene then was tried with exactly the same results.

"Now, this test was very severe, as it was made with an engine running at an overload and without an asbestos covered or water-cooled exhaust-pipe, so it is obvious that the residual-oil fuel known as 'solar-oil' running on to the exhaust-pipe, or any other part, of the *Sebastian's* engines could not have caused the fire and so supports my theory of a plot. No engineer of common sense would consequently blame the Diesel principle as the cause of the fire.

"However, the position of the fuel-filter on a grating over the engines was not a good one, and here it may be mentioned that the builders of the engines did not carry out the installation. The ship was not a new one, and the Diesel engines were fitted in rather a small space at the stern, which probably accounts for the position of the fuel filters, and they should have been arranged elsewhere. Most of the old steam auxiliaries were retained, and at one end of the engine-room was an oil-fired donkey-boiler, but whether this boiler had anything to do with the fire I do not know.

"On her last voyage to New York, the *Sebastian's* engines both made a 16-day run without stopping, even for a few minutes, averaging 8.8 knots in heavy weather, although three of the assistants in the engine-room had never before been to sea in a motorship, which fact speaks for itself."

FORCED LUBRICATION FOR MARINE TURBINES.—With the more or less general adoption of geared turbines of all classes of ocean-going vessels, in most of which, unlike the navy, there are only two engineers on watch, it has become necessary to give the subject of lubrication considerable thought with a view of obtaining a degree of simplicity and dependability which will reduce attention to a minimum. As every trade route has its own conditions it is impossible to devise a system suitable for every class of ship, but the following system is claimed to meet the requirements of many single-screw cargo carrying vessels in the ordinary trade routes.

A combined gravity and forced system offers the greatest advantages and consists simply of a pump taking oil from a drain tank and discharging it through a cooler to a gravity tank, from which it falls to the turbine bearings, etc., and back to the drain tank; or it can be by-passed, in which case it does not enter the gravity tank but is forced direct to the machinery.

The following main fittings would be required for such a system, and are stated in the order in which the oil would pass through them when traveling from the drain tank to the turbines: one drain tank; two oil strainers (one for each pump); two pumps, one working and one stand by; one oil cooler; two gravity tanks; one combined oil distributor and water and sludge collector.

The drain tank should be of sufficient capacity when full to supply oil for 15 minutes, assuming that none is returning to the drain tank. It should be a self-contained unit placed in a cofferdam in the double bottom rather than built into it, and should be easy of removal for examination.

The top should not be less than six inches below the bottom of the gear case to insure a ready drain, and not less than three inches above the double bottom tank to clear bilge water. In addition to the drain and suction pipe connections a float level indicator can be fitted so as to be easily observed from the starting platform, also an air pipe and manhole.

The body of the oil strainer may be of cast iron, having a cover easy of removal. The straining grid may be a gun metal casting or a steel tube

perforated with holes, say, one inch in diameter, but in either case the area through the grid should be about 10 times that of suction pipe.

A suitable straining medium is a 24 mesh wire gauze, which should be properly secured to the grid. The gauze will, however, reduce the effective area through the grid by about one-half.

The oil cooler may take the same form as a steam condenser, with similar tubes and packing, but with the water circulating around the outside of the tubes with preferably a four or six flow to insure good circulation.

As, however, it is economically impossible to render the flow of oil turbulent, which makes the rate of heat transfer low, certain firms construct their coolers in a different way.

The water is passed through the tubes, and the oil outside. Numerous baffles are fitted to cause the oil to flow up and down in zigzag fashion across the cooling tubes, and at each abrupt change in direction a certain disturbance is produced in the laminar flow of the oil, which facilitates the interchange of heat. At present, knowledge of oil coolers is in its infancy and there is much room for research and careful design. The present practice admits of oil discharging to turbines at 80° F. and leaving them at a maximum of 120° F.

The combined oil lubricator and water and sludge collector need be nothing more than a cylindrical casting of sufficient depth to admit of water and sludge gathering at the bottom while oil flows out at the top to the bearings and gear sprayers. It is desirable to fit separate connections from the distributor to the bearings and gear sprayers with a controlling valve at each, which facilitates adjustments, whereby bearings and sprayers will each receive their proper share of the oil. A water draw off cock placed about 12 inches from the bottom and a door for the removal of sludge are to be provided.

The turbine pipes and fittings should be tested to 50 pounds per square inch, with the exception of the tanks, for which a 5-pound test is sufficient. A relief valve should be provided near the pump, set to blow off at 50 pounds per square inch, and having an outlet led to the pump suction.—ENGINEERING.

—*Page's Engineering Weekly*, 2/5.

AERONAUTICS

NAVAL COASTAL AIR STATIONS.—The Navy Department is preparing to erect buildings at seven coastal air stations which will be located at Montauk Point, on Long Island; Rockaway Beach, on Long Island; Cape May, N. J.; the Philadelphia Navy Yard; Old Point Comfort, Va.; Key West, Fla., and near Colon, on the Canal Zone. At each of these places it is proposed to erect hangars for the accommodation of the aeroplanes and to be built of steel frame, together with quarters for officers and men and small shops for the repairs to the machines. It is estimated that about $100,000 will be expended at each place. Civil Engineer F. H. Cooke, U. S. Navy, of the Bureau of Yards and Docks, will be in charge of this construction. The Secretary of the Navy made known the existence of recommendations that aviation and submarine bases be established immediately at San Diego, Los Angeles, Ediz Hook, Wash., at the mouth of the Columbia River, and at the Mare Island and Puget Sound Navy Yards. The disclosure was made in a summary of the proposals of the board of naval officers, under Rear Admiral Helm, which recently toured the Pacific coast under authority of Congress to study this subject.—*Army and Navy Register*, 2/6.

AIRCRAFT AGAINST U-BOATS.—The following article by C. G. Grey, editor of the *London Aeroplane*, appeared in the *New York World* and was reprinted in *Flying* for May:

"There is a popular illusion, which is not exactly a delusion, that the observer in an aeroplane can see as far down into the water as a submarine

is likely to dive. Up to a point this is true, for if the water is clear it is possible to see some 20 or 30 feet into it from a point vertically above, and if such water is only 40 or 50 feet deep a submarine is not likely to dive beyond the visibility point.

"It is quite another matter, however, in the North Sea, where the water is a kind of leaden gray in color and where 10 feet of water over the periscope is enough to hide a submarine as effectually as if she were 20 fathoms down. Therefore, it is fairly obvious that the scouting aircraft have to depend on surface vision quite as much as the patrol boats. Where the difference does come in is in the angle of vision from which that surface view is obtained.

"For instance, a patrol boat might well miss seeing a periscope half a mile away, especially if the periscope were between the boat and the sun, so that the reflection of the sun off the water was dazzling the lookout men. The aircraft observer, on the other hand, perched up aloft, would have a far better chance. The periscope, cutting through the water, makes a very distinct 'wake' which spreads out on each side so that it makes a light but quite distinct 'broad arrow' of foam.

"When the periscope is above water the top of the conning tower is not far below, so that this also is visible unless there is a heavy breaking sea. And probably the bubbles from the exhausting air can also be seen.

"Thus an escort of seaplanes or of the little S. S. Type (or submarine scout) airships which are so familiar to all seafaring people around the British Isles should have a far better chance of spotting the presence of submarines than could any escort of surface ships. At the same time it is well to remember that an escort of 'destroyers' or some similar type of armed ship is necessary, because the aeroplane or airship of to-day is not capable of carrying guns big enough to sink submarines with certainty, and the art of bomb-dropping from aircraft has not become sufficiently a science to make the certainty of the bombs reaching their mark as great as is the certainty of a shell from a 4-inch gun doing so.

"Where the naval aircraft really do come in is in the immense surface of sea which they can cover in a very short time, and their ability to take enemy submarines by surprise while lying on the surface 'airing' themselves and charging up their batteries. A small fast scouting aeroplane does anything between 80 and 100 miles an hour, and at a height of 7000 or 8000 feet it is fairly hard to see. On land one is generally warned of an aeroplane's arrival by the sound of its engines; but at sea the lapping of the water and the whistling of the wind through rigging or round superstructure drowns the sound of the aero engine till it is fairly close. Consequently a seaplane has more than a sporting chance of getting within a mile or so of a submarine before it is seen, and if it gets within that distance it should be able to make things very unpleasant for the submarine, even if it has not the luck to sink it outright.

"A really big fleet of fast aeroplanes patrolling the routes followed by trade shipping and taking aboard their supplies of bombs and fuel from mother ships, of the class officially known as 'seaplane carriers,' should be able to do a great deal toward keeping all submarines well under water during all daylight hours, and one seaplane carrier with half a dozen efficient seaplanes operating therefrom, ought to be able to act by itself as an effective convoy for a flotilla of half a dozen ocean-going tramp steamers, even through waters which were known to be fairly full of enemy submarines.

"Even at night, in moderately fair weather, which is naturally the best for submarine operations, big seaplanes with searchlights could do much to keep the submarines under water, and so add to their troubles by preventing them from stopping on the surface long enough to air their interiors and to charge their storage batteries.

"Neutral shippers traveling up and down the North Sea, have doubtless met big British flying boats at one time or another all over its area, so

perhaps one may state definitely that already these big boats patrol regular from the east coast of England to the Dutch coast, near where it joins the German coast. It only needs an extension of such patrol systems to make life on the surface very unpleasant for enemy submarines."

NEW DIRIGIBLE BUILT FOR NAVY.—Reports have reached the Navy Department that the first of the 16 nonrigid dirigibles being built for the navy has made a successful flight of more than 400 miles. This dirigible left Chicago Monday at midnight and arrived at Akron between 4 and 5 o'clock Tuesday afternoon.

This is a new type of airship designed by the Navy Department, and is on the order of the "Blimps," the nonrigid dirigibles which England has been using with such success. The design was prepared by Naval Constructor J. C. Hunaker, of the Bureau of Construction and Repair, under the direction of Admiral Taylor, chief of the bureau.

Sixteen were contracted for some two months ago. The Goodyear Co., is building nine, and the others are being built by the Goodrich Rubber Co., Akron, O.; the Curtiss Aircraft Co., Hammondsport, N. Y.; and one by the Connecticut Aircraft Co., New Haven. It is expected that they will hereafter be completed at the rate of one a week and that all will be delivered by August.

The American "Blimps" will form a part of the coast patrol and will be distributed along the coast as lookouts to watch for the approach of enemy vessels. The English have found this type very effective in detecting submarines.

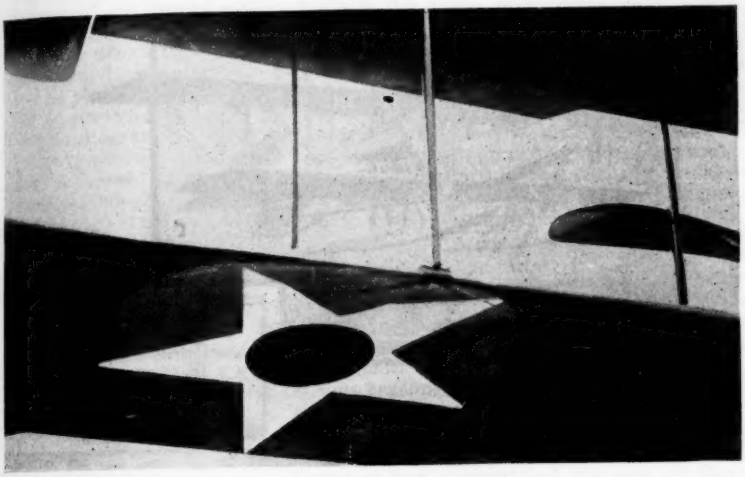
The men who will operate them are now in training at the station at Pensacola, Fla., where the dirigible *DN-1*, of an older type, which was recently delivered to the government, and aircraft of other types are being used in the training. As fast as the new dirigibles are delivered, after thorough official tests and when the crews are familiar with their operation, they will be sent to the stations selected.

Within the next two months it is expected that a number of them will be in service, and all the 16 probably by the middle of August.—*Army and Navy Register*, 2/6.

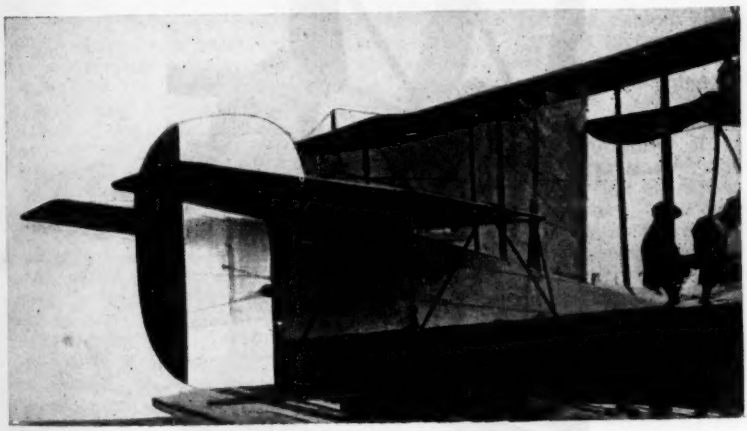
INSIGNIA FOR U. S. AIRCRAFT.—The Secretary of the Navy, on May 21, issued a general order providing for the adoption for navy aircraft of a white star with a red center on a circular background of blue as the distinguishing insignia of the third arm. This insignia, which will be carried also by the army aeroplanes, is described as follows: "A five-pointed white star inside of a blue circumscribed field, with the center of the star red. The diameter of the circumscribed circle will be equal to the chord of the wing on which the insignia is placed. The diameter of the inner circle will not extend to the inner points of the star by an amount equal to one twenty-fourth of the diameter of the circumscribed circle. The inner circle will be painted red; that portion of the star not covered by the inner circle will be painted white and that portion of the circumscribed circle not covered by either inner or star will be painted blue. The shades of red, white and blue will be the same as those used in the American flag."

The order in regard to naval craft continued: "One of each of these insignia will be placed on the upper surface of each upper wing, and one of each in a corresponding position on the lower surface of each lower wing. Both sides of that portion of the rudder which is in rear of the rudder post will be painted with three equally wide bands, parallel to the vertical axis of the aeroplane and colored red, white and blue of the same shades as mentioned hereinbefore, the blue band being nearest the rudder post, the white band in the center, and the red band at the tail of the rudder.

"One of these insignia will be placed on top and one on bottom of gas bag of dirigible balloon, the center of each insignia being in the vertical plane through the fore and aft axis of the gas bag. The center of insignia

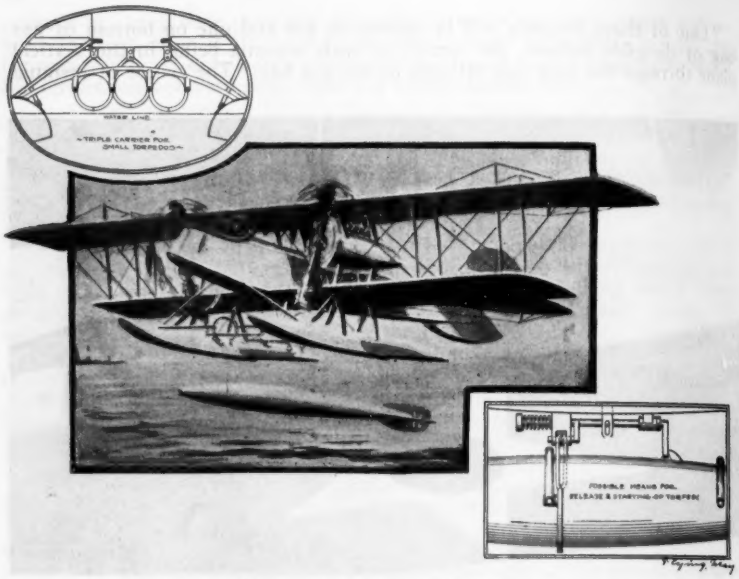


THE FIRST FIVE-POINTED STAR PAINTED ON A SEAPLANE TO CONFORM WITH SECRETARY DANIELS' NEW ORDERS REGARDING THE INSIGNIA FOR U. S. AIRCRAFT

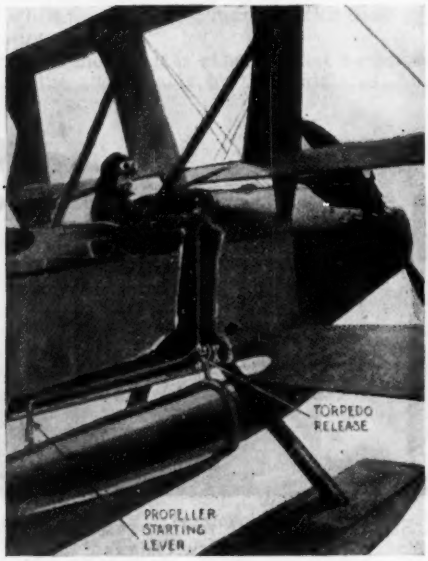


THE RUDDER OF A SEAPLANE PAINTED TO CONFORM WITH THE SECRETARY OF THE NAVY'S NEW ORDERS

on top will be 60 feet from forward end and the center of insignia on bottom will be just forward of suspension band. The circumscribing circle of insignia for dirigible will be five feet in diameter. The rudder of the



TORPEDO LAUNCHING DEVICE



TORPEDO MOUNTED ON SMALL SCOUT SEAPLANE OF TRIPLANE TYPE

Pulling the lever releases the torpedo which is securely held under the seaplane.—*Flying*, May.

dirigible will be marked in a manner similar to that applied to aeroplanes, except that stripes will not exceed five feet in length or 18 inches in width. If there is more than one rudder only the outboard side of each outboard rudder will be marked. One of these insignia will be placed on top and bottom of gas bag of captive balloon, the center of each insignia being in the vertical plane through the fore and aft axis of the bag, and two and one-half feet aft of the seam joining nose to main body. The circumscribing circle will be five feet in diameter. The building number of each aircraft will be placed in figures three inches high on each side of the rudder, at the top of the white band hereinbefore mentioned. No other markings shall be placed on any navy aircraft, except such as may hereafter be prescribed. All navy aircraft will be immediately marked in accordance with this order, and in future, specifications for navy aircraft will require that the contractors place the building number and distinguishing insignia on all aircraft, and on such spare parts as bear these marks in completed aircraft."—*Flying*, June.

That "the torpedoplane will revolutionize naval warfare" is now being admitted by naval authorities. The simple torpedo launching device developed for Admiral Fiske's torpedoplane is shown herewith. The details of the torpedo itself, which has been developed for national defence under the auspices of a group of patriotic workers for aerial preparedness, will not be made public for obvious reasons.—*Flying*, May.

TORPEDOPLANE INVENTED BY REAR ADMIRAL FISKE.—It has been established by the sinking of the British steamship *Gena*, which was torpedoed by a German airplane, that Germany has appropriated the idea of Rear Admiral Bradley A. Fiske's torpedo-carrying airplane, and thus put into practical operation another weapon of war invented by an American but neglected in this country, according to a statement by the Aero Club of America. Since it was announced on May 2 by the British Admiralty that the *Gena* had been sunk by a torpedo discharged from an airplane, officials of the Aero Club of America have sought information in England about the type of flying machine used by the Germans for this exploit. The British magazine *Flying*, which arrived May 30, brought pictures of a German torpedo-carrying seaplane which showed that the mechanism for discharging the torpedo was practically identical with that patented by Rear Admiral Fiske.

Tests of the Fiske torpedoplane are now being made at private expense, but with the approval of the Navy Department. Rear Admiral Fiske patented his invention in July, 1912, two years before the war started, and all experiments with it which have been conducted since that time have been at private expense. Henry Woodhouse, a director of the Aero Club of America, said last night that a special torpedo, which meets the conditions of lightness and efficiency needed for aerial service had been developed by Frank M. Leavitt, a torpedo expert of the E. W. Bliss Company, and would be discharged from one of the seaplanes at a target in a test which is to be held secretly this week.

The British, it was said, as well as the Germans, have been developing Admiral Fiske's invention. The chief stumbling block to its use, which the Germans have evidently overcome, is a new type of torpedo, light enough to carry considerable distance in a speedy seaplane and yet powerful enough to do plenty of destruction. There are official records of the use of the torpedoplane in the British Navy, but so far as known the British have not yet produced a torpedo which combines the necessary lightness and power.

The American air torpedo which is to be tried out weighs less than 200 pounds, and is said to be powerful enough to sink any unarmed ship. Other types of air torpedo are being developed in this country at private expense. In its bulletin issued yesterday the Aero Club said:

"It is feared that the German torpedo-launching seaplane will become an even more terrible weapon in destroying the Allies' ships than the submarine has been, because seaplanes can be built quickly, only require one or two men to operate them, and can operate against ships swiftly and almost with impunity. Twenty torpedoplanes can probably be built for the price of one submarine.

"The torpedoing of the *Gena* by a German seaplane was reported by the British Admiralty on May 2. The report read as follows: 'The British steamship *Gena* was sunk yesterday by a torpedo discharged from a German seaplane off Aldeburgh. All hands were saved. Another seaplane concerned in this attack was brought down by gunfire from the steamship *Gena* and the crew made prisoners.'"

"The following is the German version of the incident sent out from Berlin on May 2: 'Yesterday morning a number of our seaplanes attacked some enemy merchant ships off the Thames and sank a large steamer of about 3000 tons. One of our machines has not returned, and it is supposed that it is lost.'"

The picture of the German torpedoplane, which has been received, shows the torpedo held between two pontoons of the seaplane with a bracing to keep it from moving while the seaplane is flying. The mechanism for carrying and for releasing the torpedo is apparently identical with that patented by Rear Admiral Fiske. The torpedo is dropped from the seaplane and moves by its own power after it strikes the water. It is aimed before it is released, and the accuracy of its course does not depend on how it strikes the water. After its fall it automatically rights itself and starts for its destination.

Rear Admiral Robert E. Peary pointed out, May 30, that a British aviator sank four Turkish ships with torpedoes in the Sea of Marmora in August, 1915, and said that he believed that the British would soon perfect the invention. Germany had an advantage, he said, because they required at present only a seaplane carrying a torpedo which would sink merchant vessels, whereas the British would not get any benefit from such a weapon, unless they discharged torpedoes great enough to sink battleships. Rear Admiral Peary said the reason why the British battleships were not able to attack the submarine bases was because the seas surrounding them were heavily sown with mines. These could not be swept away, because German warships, which knew their way through the mines could attack the sweepers. He added that he believed the Fiske invention would ultimately enable England to deal with the submarine problem. He said:

"It seems possible to build, say 100 torpedoplanes, carrying heavy torpedoes and use them to keep away German battleships. Then the British warships can work their way right up to within range of Germany's forts and stop submarines from coming out."—*N. Y. Times*, 30/5.

BRITISH SEAPLANES CARRYING TORPEDOES.—Dr. Macnamara, in reply to questions in Parliament, said that the British Navy was supplied with seaplanes capable of discharging torpedoes, and this method of attack was first employed with success in August, 1915, by Royal Naval Air Service pilots, who sank several enemy supply ships in the Dardanelles. The good work accomplished by the Royal Naval Air Service in locating and hunting enemy submarines was fully appreciated by the Admiralty, and received frequent recognition. Full use was made of the seaplane squadrons by the senior naval officers in the various areas, and close co-operation with the patrol flotillas maintained.—*The Army and Navy Gazette*, 26/5.

OUR AIRCRAFT POLICY.—America's aircraft policy in the war against Germany was officially announced May 20 by the Council of National Defence. The first step is the organization of an Aircraft Production Board, with Howard Coffin as chairman. Mr. Coffin is a member of the Advisory Commission of the Council.

"There are two outstanding factors in modern warfare which the struggle in Europe has brought out," said Mr. Coffin. "One is the submarine, the other the aeroplane. We now believe America has started on the right road toward working out her destiny in the air and taking the place to which her capacity entitles her and which the world expects of her."

The program for the first year involves the turning out in American factories of nearly 3500 air machines, including both training and battle types, and the establishment of schools and training fields with sufficient capacity not only to man the machines, but to supply a constant stream of aviators and mechanics to the American forces in Europe.

Cadets in Training Now.—Under the auspices of six of the nation's leading engineering schools cadets already are under preliminary training for the American military air service, and negotiations for three of the nine training fields now contemplated have been approved by the War Department. Their construction will begin immediately.

To Work With Departments.—The general function of the Aircraft Production Board will be to bring manufacturers together and help make their resources available to the government and assist the government in stimulating the production of better types and greater quantities of air machines.

"Only a few American manufacturers are in a position to handle large contracts," said Mr. Coffin, "but European orders for training machines within the last two years have helped in some measure to overcome a tremendous disadvantage existing at the beginning of the war. In building battle planes the engine is the chief problem. American manufacturers are now conducting successful experiments with both new and foreign types, and we are confident that we shall be able to develop within the year the manufacture of motors of sufficient power and endurance for use at the front.

"Arrangements have been made with British and Canadian officers to standardize the training machines in use in Great Britain, Canada and the United States so that machines can be distributed impartially and without difficulty among the three nations. All reports that the United States intends to purchase aeroplanes abroad are manifestly false, since the Allies are constantly in need of more machines than their own resources can supply."

One hundred and fifty students will start training every week, 25 being assigned to each of the six government schools. The schools are situated at Cornell, Massachusetts Institute of Technology, the Universities of Ohio, Illinois, Texas and California. Before any flying is attempted the student must take an eight weeks' course in the school of military aeronautics.—*N. Y. Herald*, 21/5.

SEVEN HUNDRED AND THIRTEEN AIRPLANES BROUGHT DOWN IN MAY.—The papers figure that 713 airplanes were shot down on the western front in May, of which 442 were German and 271 British and French. British headquarters admitted the loss of 86 machines, but as the French do not announce any war losses it is impossible to verify the inference that they lost 185.

It is worthy of note that the estimate of 271 is compiled from German official reports. The total air losses for April were estimated at 709.—*Washington Post*, 3/6.

TYPES OF MACHINES LOST DURING MARCH.—The following editorial appeared in the *Army and Navy Gazette*, May 24:

I must confess my astonishment that the Germans have been so honest as to publish a fairly authentic list of British airmen and machines which are declared to have fallen on the Western front during March. The *Norddeutsche Allgemeine Zeitung* is to be commended for its frankness, for it

enables one to compare their estimate of our losses with their own. As their list gives the names of the makers of each machine that has fallen into their hands and the paper accessible to the general public in this country, where in the name of goodness was the need in the recent air debate in the House of Commons of referring to the machines in question as "X" or any other letter in the alphabet? Here is the actual list to which I refer:

Fourteen Sopwiths—two-seaters

Nos. A1108 and 4818: Lieutenant W. Reid, Lieutenant H. J. Green.
No. 4594: Occupants dead.
No. A1111: P. H. Lowndes, name of the other occupant not known.
No. A4168: Pilot dead, observer severely wounded.
No. 1907: Occupants taken prisoners.
One aeroplane, number unknown, as it was entirely burnt, with its occupants.
No. 5748: Occupants wounded and prisoners.
One aeroplane with "le Rhone" motor, 2637: Occupants dead.
No. 7763: Lieutenant Charles Stuart Vane Tempest, Lieutenant Allinson.
One machine, the number of which was not decipherable: Lieutenant Duff, Captain Stuart.

One-seaters

No. A633: Captain (?), severely wounded.
No. 6170: Occupant dead.
No. 6165: Occupant dead.
No. 6633: Name of occupant not known.

Ten Vickers—two seaters

No. 1953: Captain William S. R. Blomfield, Second Lieutenant Victor O. Lansdale.
No. A5443: Occupants taken prisoners.
One aeroplane, number not known: One occupant dead, other severely wounded.
No. 1943: Lieutenant F. E. Hills, Lieutenant A. S. Ryall.
No. A5439: Occupants dead.
One machine, number not recognizable: One occupant, Lieutenant Knight; name of the other not known.

One-seaters

No. 7941: Captain H. C. Southon.
No. 7882: Lieutenant J. M. Montembault.
No. 3425: A. M. C.: Occupant burned.
No. 4874: Second Lieutenant G. J. Hasde.

Six B. E.

No. 12205: Occupants burned.
No. 5856: Lieutenant A. G. Watts, Lieutenant G. Underwood.
No. 5179: N. C. O. Cooper, Lieutenant Appleton.
No. 6232: Lieutenant Byrne, Lieutenant Smith.
No. A27: Lieutenant Wildon Anderson, Lieutenant Duncan Boyd Wolley.
No. 2560: Occupant taken prisoner.

Six F. E.—two-seaters

No. 4803: Occupants taken prisoners.
No. 464: Lieutenant Charles A. R. Schum, Lieutenant E. C. Coops.
Two two-seaters, numbers unknown.

One-seaters

No. 6397: Second Lieutenant W. B. Hill.
No. 6456: Lieutenant Shepard.

Two Nieuport one-seaters

No. A279: Lieutenant Whiteheard.
No. 6615: Lieutenant Hugh Welch.

Spad

No. A6633: Lieutenant Parves.

Hispano-Spad

No. 6607: Lieutenant Baker.

One Martinsyde

No. 7508: Second Lieutenant Webster.

One machine, two-seater, type (?), rotary motor

R36068: Captain Lees, Bir., rank unknown.

The following English machines have fallen into German hands on the East and South-East fronts:

One Nieuport two-seater

No. 3182: Lieutenant Sydney George Beare, Lieutenant Edgar Peary Hyde.

One Sopwith two-seater

No. 5223: Two English naval officers, both dead.—*Army and Navy Gazette*, 24/5.

GERMAN AIRMEN CONCENTRATING AGAINST AMERICAN FLIERS.—German aviators are concentrating their hate on the American flyers in the Lafayette *escadrille*. No machine flying the Stars and Stripes is given a fair chance in single combat—the enemy tries to overwhelm it with a number of fighting planes.

Dr. Edmund Gros, chief organizer of the famous corps, made this statement to-day in voicing an appeal to Americans "back home" to give the *escadrille* moral and material support.

"When an aviator appears in the sky it is the signal for an enemy attack in force," he declared. "The American flag and the Indian head—the squadron's emblem—painted on their planes, have but one meaning to the enemy and that is revenge against America. Our aviators aren't given a chance to fight an equal fight, they must fight against several, and they are doing it with a bravery that ought to be better known in the United States.

"These men are upholding America's honor with their lives—and mostly on funds scraped together by interested Americans. The American War Department hasn't even sent them uniforms yet, although they fly the Stars and Stripes.

"Let the American Government back up the flag and this American bravery with real support; let them grant these men a chance to fight the enemy on equal terms. I am sending this appeal to Americans through the United Press—an appeal for support and for funds and comforts for their compatriots.

"Take the case of young Clyde H. Balsley, of San Antonio, Tex. He worked his way to Europe on a cattle steamer, landed with $2 in his pocket, offered his services at the Pau aviator school, fought with the Lafayette *escadrille* at Verdun, and is now in a hospital, his body shattered by an explosive bullet which may make him an invalid for life—if he survives. He needs comforts and the support of his fellow countrymen."

Relatives of the American fliers who have fallen on the field of honor under the American flag will receive the posthumous honors conferred upon them, it was made known to-day.

Citations just issued give the Cross of the Legion of Honor to Lieut. H. Delaage, one of the French officers in command of the Lafayette *escadrille*. The War Cross, with palm, is given posthumously to James MacConnell, Edmond Genet, Ronald Hoskier and Jean Dressy—the last named the French machine gunner who died with Hoskier.—*Washington Post*, 3/6.

MERCHANT MARINE

BRITISH CONSTRUCTION IN THE UNITED STATES.—We are informed that the British Government is not pleased over the prospect of having the tonnage building to its order in this country requisitioned by the U. S. Shipping Board. Conferences on this subject have been proceeding in Wash-

ington. According to statements made in the Senate, England has now building in the United States 169 steel steamers aggregating 1,024,000 tons, contracted for at prices ranging from $170 to over $200 a ton. For other nations, chiefly Norway, 64 steel vessels are being built or are on order, making a foreign total of 233 steel vessels. The U. S. Shipping Board proposes to spend $250,000,000 to commandeer this tonnage and $450,000,000 on new construction. The American Bridge Company has offered to contract with the government to deliver beginning six months from date, one steel ship of 5000 tons every day as long as needed, or 365 ships a year at a price of $153 a ton, while wooden ships will cost $135 a ton. The full capacity of the shipbuilding yards of the country was placed at 5,000,000 tons per annum. The present rate of construction is 1,500,000 tons. Senator Smoot read the testimony of General Goethals showing that all he desired was the right to expedite this British construction, so as to get it off the ways and put other ships on. He made a strong plea against the United States interfering, pointing out that the ships would go into the same service.—*Shipping Illustrated*, 26/5.

GENERAL GOETHALS' ACHIEVEMENTS.—General Goethals has rendered a service to this government second to nothing he has done in his notable career by compelling the adoption of a program of new ship construction which, while not abandoning entirely wooden ships, provides for the building of steel vessels. These columns predicted that it would be found impossible to build 1000 wooden ships in 18 months and that the shipping board must come to steel vessels. In the first place, it was found impossible to get the material for wooden ships; they would come to pieces within a year or two, while the steel ships will meet all the conditions of the service, defy the elements, and survive the war, to be useful in the competition in oversea trade which will be the sequel of this great conflict. With the $500,000,000 to be appropriated by Congress 3,000,000 tons of wooden and steel ships will be built, and, of these, 700,000 tons, or less than 25 per cent, will be of the former type. The steel vessels will probably be, for the most part, of 3600 tons displacement with the possibility of 12,000-ton ships so subdivided in internal structure as to resist the attack of submarines. The B. & W. Company has agreed to extend its plant for the production of boilers, while the Westinghouse Company will build any number of turbines. We should, therefore, have steel ships equipped with water-tube boilers, oil-burners, and reduction-gear turbines capable of competing with the world as commerce-carriers and of meeting on terms of indifference the submarine warfare of the enemy. General Goethals has been wise in his selection of technical assistance for the development of his general plan, including such experts of Professors McDermott, of Cornell; Karney, of the bureau of Steam Engineering; McGowan superintending the construction of army transports, and Mr. Eads Johnson. General Goethals has come to the aid of the country in its extremity with a resoucefulness, determination, and courage quite in keeping with his reputation.—*Army and Navy Register*, 2/6.

U. S. STEEL CORPORATION.—The United States Steel Corporation is preparing to enter the shipbuilding field on a large scale through its subsidiary, the American Bridge Company. Sixty acres of land have been bought in the Hackensack Meadows, on Newark Bay, in a locality where comparatively little dredging will be required to get sufficient depth of water for large freight ships to make their way out through Staten Island Sound to the sea. The plans of the corporation have not been worked out, but in the steel trade it is understood that the management is contemplating the rapid construction of standardized cargo boats running from 5000 to 8000 tons dead weight.—*N. Y. Times*, 24/5.

NATIONAL INSURANCE FOR SEAMEN.—The Senate May 22, passed without debate the bill of Senator Simmons providing for the creation of a Bureau

of War Risk Insurance in the Treasury Department, with an appropriation of $5,000,000 to carry it on. The bureau is to insure American merchant vessels, officers, and crews of the vessels against accident, loss of life or loss of their effects.

The insurance of officers and crews is a new feature of the bill. Another change made in it since it was originally offered in the Senate was to increase the appropriation at the disposal of the War Risk Bureau from $15,000,000 to $50,000,000.

The measure now goes to the House Committee on Ways and Means. Owing to the grave risk of navigation through the barred zone and the inability of shipowners to get insurance at reasonable rates, it is expected that the bill will be passed by the House without opposition.

The bureau is empowered to adopt forms of war risk policies and to fix what it regards as reasonable rates of premium. These rates may be changed as conditions justify. If submarine activity were particularly violent, the rates would be raised, but with a slackening of it they would be cut down.

The rates of insurance for officers and crews of vessels are provided as follows in the bill:

"In the event of death, permanent disability, or the loss of both arms, both feet, both legs, both eyes, a payment equivalent to one year's earnings, or to 12 times the monthly earnings, the insurance not to exceed $5000 or to be less than $1500.

"Loss of one hand, 50 per cent of the yearly earnings; loss of one arm, 65 per cent; loss of one foot, 50 per cent; one leg, 65 per cent; one eye, 45 per cent; total deafness, 50 per cent."

In the event of capture of a vessel and detention of officers or crew, they are to receive during the time of detention compensation at the same wage as when employed on the ship.

The bill provides that if the owner of any vessel fails to insure his ship and men before leaving port, the War Risk Bureau may arrange for complete insurance, charging it up to the vessel's owners. This makes insurance of both ships and crews compulsory. The bill also fixes a penalty not exceeding $1000 for failure of an owner to insure his.

The bureau is authorized to establish an advisory board of three members, skilled in the practices of war risk insurance to aid the bureau in fixing rates of premium and to adjust claims for losses, both of life and property. The director of the War Risk Bureau is to get $7500 a year salary and the three members of his advisory board compensation for the work they perform not to exceed $10 a day each, while actually engaged. To maintain the office of the bureau $50,000 is authorized, the $50,000,000 being set apart entirely for insurance payments.

In a report accompanying the bill in the Senate the purposes of the measure were explained. It says:

"The bill is to create an insurance, the premium to be carried by the shipowner, protecting the master, officers and crew of American vessels engaged in sailing through dangerous waters, against loss of life or personal injury caused by the risks of war and to give them compensation should they be detained as prisoners by the enemy; to assist in the prosecution of the war by providing the fullest facilities for insurance against risks of war for vessels and their cargoes destined to countries at war with Germany; to supplement the existing insurance market, stabilize rates and as a consequence assist the foreign commerce of the United States.

"With these ends in view the bill, if enacted, would make it possible for the United States to enter into a reciprocal reinsurance arrangement with countries which are at war with Germany to mutual advantage."

The memorandum explains that one of the features of the bill is to permit re-insurance of allied vessels under the American flag if it is desired. Proceeding, the report says:

"Seamen sailing on American vessels to the war zone are at the present time exposed to loss of life and personal injury, and it is manifestly necessary that these men, on whose services so much depends, should be encouraged to seek or continue in the employment of such vessels by being assured by the government of proper and reasonable indemnity in event of loss of life or personal injury by war risks and of compensation in the event of capture and detention by the enemy.

"The importance and necessity of such insurance through the war zone is so great that the bill provides that when it appears to the Secretary of the Treasury desirable in the national interest he may require owners to effect such insurance at their own expense. In the event of the owners failing to do so, the Secretary of the Treasury is authorized to effect such insurance at the owner's expense."—*N. Y. Times*, 23/5.

GOVERNMENT CONTROL OF SHIPPING.—The conferees late Saturday (June 2) reached an agreement in connection with what was known as amendment No. 2 of the Senate relative to the commandeering of ships, factories, etc., and the provision quoted below was accepted as a substitute for the language proposed in the bill as passed by the Senate. In effect the compromise provision is much the same as the Senate amendment, the principal changes being the substitution of the word "plant" instead of "factory" and the modified provision regarding the President delegating the powers accorded under the provision to such agencies as he might elect, instead of using the term "general manager of the United States Shipping Board Fleet Corporation" as was used in the Senate amendment. The Senate has already adopted the report of the conference committee and the House will do likewise inasmuch as the substitute provision was largely insisted upon by the House.

The President is hereby authorized and empowered, within the limits of the amounts herein authorized—

(a) To place an order with any person for such ships or material as the necessities of the government, to be determined by the President, may require during the period of the war and which are of the nature, kind and quantity usually produced or capable of being produced by such person.

(b) To modify, suspend, cancel, or requisition any existing or future contract for the building, production, or purchase of ships or material.

(c) To require the owner or occupier of any plant in which ships or materials are built or produced to place at the disposal of the United States the whole or any part of the output of such plant, to deliver such output or part thereof in such quantities and at such times as may be specified in the order.

(d) To requisition or take over for use or operation by the United States any plant, or any part thereof without taking possession of the entire plant, whether the United States has or has not any contract or agreement with the owner or occupier of such plant.

(e) To purchase, requisition or take over the title to, or the possession of, for use or operation by the United States any ship now constructed or in the process of construction or hereafter constructed, or any part thereof, or charter of such ship.

Compliance with all orders issued hereunder shall be obligatory on any person to whom such order is given, and such order shall take precedence over all others and contracts placed with such person. If any person owning any ship, charter, or material, or owning, leasing, or operating any plant equipped for the building or production of ships or material shall refuse or fail to comply therewith or to give to the United States such preference in the execution of such order, or shall refuse to build, supply, furnish, or manufacture the kind, quantities, or qualities of the ships or material so ordered, at such reasonable prices as shall be determined by the President, the President may take immediate possession of any ship, charter, material, or plant of such person, or any part thereof without

taking possession of the entire plant, and may use the same at such times and in such manner as he may consider necessary or expedient.

Whenever the President shall cancel, modify, suspend, or requisition any contract, make use of, assume, occupy, requisition, acquire, or take over any plant or part thereof, or any ship, charter, or material, in accordance with the provisions hereof, it shall make just compensation therefor, to be determined by the President; and if the amount thereof, so determined by the President, is unsatisfactory to the person entitled to receive the same, such person shall be paid 75 per cent of the amount so determined by the President and shall be entitled to sue the United States to recover such further sum as, added to the 75 per cent, will make up such amount as will be just compensation therefor, and in the manner provided for by section 24, paragraph 20, and section 145 of the Judicial Code.

The President may exercise the power and authority hereby vested in him and expend the money herein and hereafter appropriated through such agency or agencies as he shall determine from time to time; Provided, that all money turned over to the United States Shipping Board Emergency Fleet Corporation may be expended as other moneys of said corporation are now expended. All ships constructed, purchased, or requisitioned under the authority herein, or heretofore or hereafter acquired by the United States, shall be managed, operated, and disposed of as the President may direct.

The word "person" as used herein shall include any individual, trustee, firm, association, company, corporation, or contractor.

The word "ship" shall include any boat, vessel, or submarine and the parts thereof.

The word "material" shall include stores, supplies, and equipment for ships and everything required for or in connection with the production thereof.

The word "plant" shall include any factory, workshop, warehouse, engine works, buildings used for manufacture, assembling, construction, or any process; any shipyard or dockyard and discharging terminal or other facilities connected therewith.

The words "United States" shall include all lands and waters subject to the jurisdiction of the United States of America.

All authority granted to the President herein, or by him delegated, shall cease six months after a final treaty of peace is proclaimed between this government and the German Empire.

The cost of purchasing, requisitioning or otherwise acquiring plants, material, charters, or ships now constructed or in the course of construction and the expediting of ships thus under construction shall not exceed the sum of $250,000,000, exclusive of the cost of ships turned over to the army and navy, the expenditure of which is hereby authorized, and in executing the authority granted by this act for such purpose the President shall not expend or obligate the United States to expend more than the said sum; and there is hereby appropriated for said purposes $150,000,000; Provided, That this appropriation shall be reimbursed from available funds under the War and Navy Departments for vessels turned over for the exclusive use of those departments or either of them.

The cost of construction of ships authorized herein shall not exceed the sum of $500,000,000, the expenditure of which is hereby authorized, and in executing the authority granted herein for such purpose the President shall not expend or obligate the United States to expend more than said sum; and there is hereby appropriated for said purpose, $250,000,000.

For the operation of ships herein authorized or in any way acquired by the United States, except those acquired for the army and navy, and for every expenditure incident thereto, $500,000,000.—*Shipping Illustrated*, 9/6.

WOODEN SHIP CONTROVERSY.—Maj. General George W. Goethals, speaking informally (May 25) at the annual dinner of the Iron and Steel Institute,

declared that the proposal to build one thousand 3000-ton wooden ships in 18 months "is simply hopeless" for the reason, he said, it had become necessary to turn to steel as well as wood.

"As I need assistance and cooperation in my work," said General Goethals, "I concluded to tell you my troubles and ask your help. On the principle of the selective draft I have been again called to the government's service and confronted with the proposition to turn out one thousand 3000-ton wooden ships in 18 months—wood because it was not possible to get steel and because they could be constructed in less time.

"I found that contracts for wooden ships had been let in all directions, but was unable to find plans or specifications. When you consider that the birds are now nesting in the trees that will go to build those ships—ships that must attain a speed of 10½ knots and several additional knots to escape submarines—why the proposition is simply hopeless.

"I called on Mr. Farrell, of the United States Steel Corporation, and I asked him if it were possible to turn to steel. He assured me it would be possible. I announced it and asked permission to turn to steel as well as wood. I finally got permission.

"Fifty million dollars were appropriated for these ships from the sale of Panama Canal bonds, but no effort has yet been made to sell those bonds. Money is as necessary as anything else. I began a campaign for money, and as I regard all boards as long, narrow and wooden, and being a firm believer in absolute authority in all undertakings, I wanted money and authority.

"This is now being discussed in the House committee on appropriations and I have been promised the money in 10 days or two weeks.

"I had a second conference with Mr. Farrell and he promised to see the program carried out if we turned to steel and he promised also to turn out 3,000,000 tons of steel ships in 18 months.

"As the ships built will ultimately go to the merchant marine, if they escape the submarine, they should be as far as possible of steel construction. I want the Institute to get back of Mr. Farrell and to carry out the promise.

"The shipyards are full. I have asked for legislation to prevent the laying down of any ships for any one but for us. I want to enlist the cooperation and assistance of the structural steel people.

"I have got to have the cooperation of manufacturers, makers of machinery, chains, wire cables, in fact everything that goes to make the completed ships, and, if what Lloyd George said is true, that ships are going to win the war, everybody who helps build ships will help win the war."—*Washington Post*, 26/5.

Replying May 27 to Maj. General Goethals' declaration that the shipping board's wooden ship program intrusted to the general is hopeless. Chairman Denman of the board issued a statement declaring that with the most successful steel building campaign possible there still will be need for a thousand wooden ships.

Referring directly to General Goethals' speech at a dinner in New York, Mr. Denman said:

"We believe that the committees of Congress, and not a public dinner with the head of the steel trust, are the places for the discussion of matters of policy with regard to shipbuilding.

"The shipping board has but one purpose in its activities in Washington at the present time," said Mr. Denman. "That is, to use its utmost endeavors and powers to defeat the submarine campaign of the German Empire. No person, nor any interested group of capitalists, can draw any one of us into a controversy with General Goethals, or do we think the general is seeking it.

"If all the ships that can be built within the next 18 months are built, there still would be need for a thousand wooden ships to make good the deficit in our merchant tonnage."

Of General Goethals' statement that the Treasury has made no effort to sell $50,000,000 worth of Panama Canal bonds to provide funds for the board's work, Mr. Denman said:

"Every request we have made to the Treasury for money has met a quick response. It was not necessary to sell Panama Canal bonds to obtain money, and General Goethals must have been under some misapprehension in regard to this matter."—*Washington Post*, 28/5.

Maj. General Goethals, general manager of the Emergency Fleet Corporation, dismissed F. A. Eustis, of Boston, assistant general, and F. G. Clark, of New York, the two engineers who originated the wooden fleet idea.

The dismissal of Eustis and Clark followed their action of June 7 in issuing statements virtually charging General Goethals with holding up the shipbuilding program in the nation's emergency.

Eustis and Clark, both engineers, brought the idea of quickly building a great fleet of standardized wooden cargo carriers to combat the submarine menace to the shipping board, but General Goethals disapproved of it in the main.

Ever since General Goethals became general manager of the fleet corporation, the shipping board's instrument of operation, there has been a great disagreement over whether the ships should be of steel or wood. General Goethals in the main favored steel, but the shipping board gave him absolute authority to decide the question and build the fleet.

Eustis and Clark, chafing under the opposition to wooden ships, and, they publicly announced in their statements, the delay in getting the fleet started, felt that the country was being imperiled by not adopting the plan of quickly building a fleet to run the submarine blockade and decided last night to force the issue by making their statements.

Their statements charged Goethals with blocking the shipbuilding plan by insisting on what they characterized as an impossible form of contract. They also gave the names of shipbuilding concerns, which, they said, were ready to turn out the cargo carriers if Goethals would sign the contracts.

General Goethals announced the discharge of the two engineers in a memorandum to Chairman Denman of the shipping board.

"The usefulness of these two gentlemen in this organization is at an end," said General Goethals. "Mr. Eustis was retained at your suggestion and given a position of responsibility. How he has fulfilled his duties his statement to the press discloses.

"Under the circumstances I am expecting the resignation of Mr. Eustis as a member of the executive committee of the United States Shipping Board's Emergency Fleet Corporation and am discharging him from the service for lack of loyalty and misstatements and misrepresentations of facts. This applies to his employment with the corporation, and of course has no bearing on the dual position he occupies as agent of the shipping board. Mr. Clark is to be dismissed from the service for the similar reasons."

General Goethals, in his memorandum, brands as false the statements made by Mr. Eustis and Mr. Clark.

"The most serious charge in their statements," said General Goethals, "is that by insisting on a lump sum bid I am shutting out all contractors who are desirous of assisting in the shipbuilding scheme, because these are not able to estimate on labor and the material conditions as they exist to-day, thereby delaying the construction of ships.

"The charge is false. You were present at the hearing before the House Committee on Appropriations May 22, in which the method of cost plus percentage was discussed and disposed of. You made the statement that you favored the lump sum basis. On returning to the office I took action along these lines.

"In wooden ship construction we are paying for the ways and necessary equipment when requested, and protecting the contractor on account of

advances in the cost of labor and in the prices of materials. The only contingency unprotected is inexperience, which is not a contingency if the prospective contractor possesses the necessary and proper organization for carrying on the work.

"On April 25 I made certain recommendations to you concerning the necessary authority. There was $50,000,000 available, and contracts were limited to this amount until the hearings were held, that I might truthfully tell the committee that I had not obligated the government beyond the amount available.

"Subsequent to the hearing I removed the limit, and I have obligated the government in excess of the amount to $20,000,000 or $25,000,000. This shows the falsity of these statements that ship construction is being delayed unnecessarily.

"A competent naval architect was employed. He will not approve the Hough or the Donnelly plan for ships engaged in overseas travel, due to the lack of proper longitudinal strength.

"The former plans have been modified with the view of strengthening construction sufficiently to warrant the building of a limited number of ships of this design, which are to be built under the personal supervision of Mr. Hough. In view of the recommendation of the naval architect, I am not willing to take the responsibility of contracting for the construction of ships along those designs."—*Washington Star*, 8/6.

Maj. General George W. Goethals, general manager of the Emergency Fleet Corporation, June 9 appointed Civil Engineer Harry H. Rousseau, U. S. Navy, as assistant general manager of the corporation, and Samuel L. Fuller, of New York, as assistant to the general manager. They succeed F. A. Eustis and F. H. Clark, who were summarily dismissed by the canal builder yesterday for a public attack on the management of the fleet corporation.

General Goethals said to-day:

"Mr. Fuller is volunteering his services. He has had extensive experience in the investigating of projects and in financing. I am going to utilize him in looking into the financial standing of people who want to undertake the construction of ships, both steel and wood. He also will be used in appraising ships that are now on the ways, that we will probably take over under legislation now pending in Congress."—*N. Y. Herald*, 10/6.

Those who know General Goethals were not surprised at his public expression of disgust with the situation created by the shipping board's extravagant promises to break the submarine blockade by means of wooden boats the material of which is still affording nesting places for birds. "Wooden heads" is what General Goethals implied his colleagues were, when he stated that in all his experience he had found all boards "narrow and wooden." Mr. Denman, chairman of the Shipping Board retorts that he and General Goethals are in complete agreement, but the fact remains that as long as the Canal builder remains chairman of the Emergency Fleet Corporation, we are not likely to see ships built of green timber. Perhaps the situation can be better explained by quoting from an article by C. W. Gilbert, which appeared this week in the *New York Tribune:*

"But how is the building of ships to go on under these circumstances? The board is discredited. Congress has not appropriated the money for it to spend. Vast powers of commandeering ships, yards, docks, factories and their outputs are to be exercised, and by whom? By the board which Congress distrusts or by the subordinate who has defied it? This very question is raised by the pending legislation appropriating the money and creating the powers.

"As the bill was originally offered to the Senate, read by Mr. Denman himself to a committee of Senators invited to the White House by the President for the purpose, it granted all these vast powers to the Shipping

Board. These Senators present listened to Mr. Denman and unanimously, Republicans and Democrats alike, agreed that they would never give these powers to him and his assistants on the shipping board.

"A bill was then drawn up by Spooner & Coffin, of New York, said to be General Goethal's attorneys, providing that the President might direct the general manager of the U. S. Shipping Board Emergency Fleet Corporation—that is, General Goethals—to exercise these powers. Many of them were inappropriate to his position, but the Senate had confidence in the general and none in the shipping board and was glad to see the powers go to him and not to Mr. Denman.

"Now the House has stricken out this provision and declares that the President may exercise the authority granted 'through such agency or agencies as he at any time shall determine.' This is done in no spirit of unfriendliness to General Goethals, for the House trusts him and does not trust the shipping board. But the House feels that these powers to commandeer cannot properly be lodged in any one but the President, certainly not in the general manager of a private corporation, which is all General Goethals is. This is the tangle, the usual tangle down here, of little men at the top and the big man at the bottom, where he cannot be fully used.

"The questions what to do with these powers, now that it has been raised, is likely to hold up this bill, and thus shipbuilding will again be delayed. It is not known whether or not General Goethals will object to the change in the proposed act. But the Senate, having already voted its confidence in him and its lack of confidence in the shipping board, will probably refuse to leave it to the President to decide whether Mr. Denman or General Goethals shall exercise the authority.

"Mr. Denman, chairman of the shipping board, is a handsome, active man, with a rare abundance of speech. A torrent of facts and figures flows from him, but in his case the mill never grinds with the waters that are past. To-day it is wooden ships; to-morrow it is steel. To-day it is 1000 of them; to-morrow it is 100. To-day it is 1,000,000 tons; to-morrow it is 3,000,000. An optimist whose imagination sustains his cheerfulness, he touches actuality only lightly and gracefully in passing. With his temperament it is a short step from "trees with birds nesting in them" to an Allied victory.

"When General Goethals said that boards were long, narrow and wooden he was expressing his general dislike of power in several hands. He had his trouble with the Panama Canal Commission. He used to call it together, only to find himself out-voted. Finally he explained the situation to President Roosevelt, and had each member of the commission assigned to some specific duty, and then he ran everything himself. No such easy solution exists in this case. The little men are on the job, and the General is not even an employee of the government. He is manager of a private corporation."—*Shipping Illustrated*, 2/6.

CONSTRUCTION UNDERWAY.—In response to the Senate's resolution of inquiry, Secretary Redfield notified Congress yesterday that on May 1 there was under construction in the United States 537 steel vessels with a total tonnage of 2,039,000 and 167 wooden vessels aggregating 214,700 tons.

The figures are nearly double those of a year ago.—*Washington Post*, 3/6.

WILL TRAIN AMERICAN MERCHANT OFFICERS.—Schools for training officers for the American merchant marine are to be established by the U. S. Shipping Board along this coast. The first was opened at Boston on June 4, and 14 similar institutions are to follow. A little later it is expected that this training system will be extended to the Pacific Coast and the Great Lakes; the object being to prepare some 10,000 officers to man the new ships building in U. S. shipyards.—*Marine Journal*, 9/6.

EMERGENCY RULING FOR FOREIGN OFFICERS ABOARD AMERICAN MERCHANTMEN.—The Bureau of Navigation of the Department of Commerce has ruled that American vessels in foreign ports, when unable to obtain a full complement of American officers, may, in such emergency, ship foreign officers to fill vacant berths, and that under such circumstances the penalties imposed by the Seaman's Act shall not be collected until port collectors have communicated with the Department of Commerce.—*The Marine Journal*, 2/6.

TELEGRAPHIC AND CABLE RESTRICTIONS.—The New York shipping exchanges have been cut off by the Navy Department from regular telegraph and cable service giving them the movements of vessels. It is understood that this sudden severance of the service is due to the recent leak about the despatch of the destroyers to England. In the meantime considerable inconvenience has been caused to shipping interests. While it is hoped that the order will soon be rescinded, it seems that the exchanges might go a long way toward preventing causes of friction between traders and the authorities, if they adopted a rule barring enemy aliens from the floor as long as the war lasts. This was done in England early in the war and the wisdom of similar action will soon become obvious here also.—*Shipping Illustrated*, 9/6.

STRIKE AT NEWPORT NEWS.—Union labor's demands for double-time pay for every hour of work beyond the usual eight-hour day is furnishing a troublesome problem for the Navy Department in its efforts to speed up naval construction.

When the union officials objected to lengthened days with time and a half for extra hours, the department planned to keep work in progress at high speed by putting on two or even three shifts in the emergency branches. They were informed, however, that every additional and independent shift after the first force must be paid double time.

The officials now are seeking some solution that will not enormously increase the expense of building warships.

NEWPORT NEWS, VA., May 29.

With officials of the shipyard and strikers declining to make statements, the machinists' strike witnessed no developments of importance to-day. There has been no disorder. Some strikers are preparing to go elsewhere in search of work.

More than 500 machinists quit the yard June 29, being refused higher wages. The yard, although handicapped, is continuing operations as usual.—*Washington Post*, 30/5.

PERSONNEL

TEMPORARY INCREASE OF NAVY.—The President on May 22 signed the bill, H. R. 3330, which follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the authorized enlisted strength of the active list of the navy is hereby temporarily increased from 87,000 to 150,000, including 4000 additional apprentice seamen.

Sec. 2. That the authorized enlisted strength of the active list of the marine corps is hereby temporarily increased from 17,400 to 30,000, this authorized strength being distributed in the various grades of the enlisted force in the same proportion as those authorized at the date of the approval of this act.

Sec. 3. That enlistments in the navy and marine corps, during such time as the United States may be at war, shall be for four years or for

such shorter period or periods as the President may prescribe, or for the period of the present war.

Sec. 4. Additional commissioned officers in the navy and marine corps, based upon the temporary increases herein authorized in the number of enlisted men, shall be temporarily appointed by the President, in his discretion, with the advice and consent of the Senate, not above the grades and ranks of lieutenant in the line and staff of the navy and major in the marine corps, the distribution in said grades and ranks to be made in accordance with the provisions of the act of August 29, 1916: Provided, That all temporary original appointments shall be made in the lowest commissioned grades of the line and staff of the navy and marine corps, exclusive of commissioned warrant officers, and that there shall be no permanent or temporary appointments in or permanent or temporary promotions to any grade or rank above that of lieutenant in the navy or major in the marine corps by reason of the temporary appointment of officers authorized by this act in excess of the total number of officers authorized by existing law or on account of the increase of enlisted men herein authorized: Provided further, That, during the period of the present war, the deficiency existing prior to the passage of this act in the total number of commissioned officers of the navy and marine corps authorized by the act of August 29, 1916, may also be supplied by temporary appointments in the lowest grades and by temporary promotions to all other grades until a sufficient number of officers shall be available for regular appointment or promotion in accordance with existing law: Provided further, That nothing herein shall be held or construed to limit or abridge the use or service of the officers of the navy and marine corps on the retired list or of the officers of the naval militia and national naval volunteers, naval reserve force, and marine corps reserve, as provided and authorized under existing law: Provided further, That temporary chaplains and temporary acting chaplains in the navy may be appointed for service during the period of the war in the proportion of the personnel of the navy as now prescribed by existing law.

Sec. 5. That the additional temporary officers authorized in the various grades and ranks of the navy and marine corps in accordance with the next preceding section may be temporarily appointed to serve in the grades or ranks to which appointed or promoted by the temporary advancement of officers holding permanent and probationary commissions, by temporary appointment of commissioned warrant officers, warrant officers, and enlisted men of the navy, and warrant officers, noncommissioned officers, and clerks to assistant paymasters of the marine corps, commissioned and warrant officers of the United States coast guard, citizens of the United States who have had previous naval or military service or training, and other citizens of the United States specially qualified: Provided, That in making appointments authorized herein the maximum age limit shall be 50 years for commissioned warrant officers, warrant officers, and enlisted men to ensign, enlisted men of the navy to warrant rank, candidates for assistant surgeon, noncommissioned officers of the marine corps to commissioned rank, members of the national naval volunteers' marine corps reserve, and civilians specially qualified to commissioned rank, and warrant officers of the active list of the marine corps appointed to commissioned rank, and temporary chaplains and temporary acting chaplains: Provided further, That graduates of the Naval Academy and warrant officers duly commissioned in the navy or marine corps in accordance with existing law shall not, by virtue of this act, be required to receive temporary appointments; and the class of midshipmen graduated from the Naval Academy on March 29, 1917, and the classes to be graduated hereafter, may be commissioned effective from date of graduation: Provided further, That temporary appointment as warrant officers of the navy may be made by the Secretary of the Navy: Provided further, That lieutenants (junior grade) and ensigns may be considered eligible for temporary promotions to the

grades of lieutenant and lieutenant (junior grade), respectively, without regard to length of service in grade.

Sec. 6. That during the period of the present war the computations to be made by the Secretary of the Navy as prescribed by the act of August 29, 1916, shall be made semi-annually as of July 1 and January 1 of each year and at such other times as he may deem necessary; and the board of rear admirals for selection for promotion prescribed in said act may be convened at such times as the exigencies of the service may require and shall recommend for promotion such number of officers as the Secretary of the Navy may prescribe. To fill vacancies in the staff corps as provided by existing law.

Sec. 7. That the permanent and probationary commissions, appointments, and warrants of officers shall not be vacated by reason of their temporary advancement or appointment, nor shall said officers be prejudiced in their relative lineal rank in regard to promotion in accordance with the act of August 29, 1916: Provided, That the rights, benefits, privileges, and gratuities of all enlisted men of the navy and marine corps now authorized by law shall not be lost or abridged in any respect whatever by their acceptance of temporary commissions or warrants hereunder: Provided further, That no person who shall receive a temporary appointment shall be entitled to pay or allowances except under such temporary appointment: And provided further, That upon the termination of temporary appointments in a higher grade or rank as authorized by this act the officers so advanced, including probationary second lieutenants, warrant officers, clerks to assistant paymasters, and enlisted men of the navy and marine corps, commissioned and warrant officers of the United States coast guard, shall revert to the grade, rank or rating from which temporarily advanced, unless such officers or enlisted men in the meantime, in accordance with law, become entitled to promotion to a higher grade or rank in the permanent navy or marine corps, in which case they shall revert to said higher grade or rank and shall, after passing the prescribed examinations, be commissioned accordingly.

Sec. 8. That all temporary appointments or advancements authorized by this act shall continue in force only until otherwise directed by the President or until Congress shall amend or repeal the authorization for the increases herein provided and not later than six months after the termination of the present war.

Amendment No. 10 added the words "the present" at the end of Section 8.

Sec. 9. That any officer of the permanent navy or marine corps, temporarily advanced in grade or rank in accordance with the provisions of this act, who shall be retired from active service under his permanent commission while holding such temporary rank, except for physical disability incurred in line of duty, shall be placed on the retired list with the grade or rank to which his position in the permanent navy or marine corps at the date of his retirement would entitle him, and any person originally appointed temporarily, as provided in this act, shall not be entitled to any rights of retirement, except for physical disability incurred in line of duty.

Sec. 10. That, during the continuance of the present war, should any second lieutenant of the marine corps holding a probationary appointment for the period of two years become eligible for promotion to a higher grade and qualify therefor before the expiration of two years from the date of original appointment, he shall receive a probationary appointment in such higher grade, which appointment shall be made permanent or shall be vacated in the manner prescribed by the act of August 29, 1916.

Sec. 11. That the appointment of 30 marine gunners, 30 quartermaster's clerks, and nine clerks to assistant paymasters, additional to the number now prescribed by law, and the temporary appointment of eight clerks to assistant paymasters for the war, is hereby authorized, such appointments to be made in the manner now provided by law.

Sec. 12. That the temporary appointments and promotions herein authorized shall be made by the President, with the advice and consent of the Senate.

Sec. 13. Nothing contained in this act shall operate to reduce the rank, pay, or allowances that would have been received by any person in the navy, marine corps or coast guard except for the passage of this act.

Sec. 14. That the provisions of the act entitled "an act making appropriations for the naval service for the fiscal year ending June 30, 1917, and for other purposes," approved August 3, 1916, which read as follows: "Provided further, That the increase in the number of captains herein authorized shall be made at the rate of not more than 10 captains in any one year" and "That officers of the marine corps with the rank of colonel who shall have served faithfully for 45 years on the active list shall, when retired, have the rank of brigadier general; and such officers who shall hereafter be retired at the age of 64 years before having served for 45 years, but who shall have served faithfully on the active list until retired, shall, on the completion of 40 years from their entry in the naval service, have the rank of brigadier general," are hereby repealed.

Sec. 15. That commencing June 1, 1917, and continuing until not later than six months after the termination of the present war all enlisted men of the navy of the United States in active service whose base pay does not exceed $21 per month shall receive an increase of $15 per month; those whose base pay is over $21 and does not exceed $24 per month, an increase of $12 per month; those whose base pay is over $24 and less than $45 per month, an increase of $8 per month; and those whose base pay is $45 or more per month, an increase of $6 per month: Provided, That the increases of pay herein authorized shall not enter into the computation of continuous-service pay: Provided, That during the continuance of the present war, warrant officers, petty officers and enlisted men of the United States coast guard shall receive the same rates of pay as are or may hereafter be prescribed for corresponding grades or ratings and length of service in the navy.

Sec. 16. Authorizes the President, whenever in his judgment a sufficient national emergency exists, to transfer to the service and jurisdiction of the War Department, or of the Navy Department, the vessels, equipment, stations, and personnel of the Coast and Geodetic Survey, etc.

Sec. 17. That nothing contained in the act of August 29, 1916, shall operate to disturb the relative position of officers in the medical corps with reference to precedence or promotion, but all such officers otherwise qualified shall be advanced in rank with or ahead of officers in said corps who were their juniors on the date of said act.

Sec. 18. That the President be, and he is hereby, further authorized to designate six officers of the navy for the command of fleets or subdivisions thereof and, after being so designated, from the date of assuming such command until relinquishment thereof, not more than three of such officers shall each have the rank and pay of a vice admiral; and the grades of admiral and vice admiral are hereby authorized and continued for the purpose of this act: Provided, That in time of war the selections under the provisions of this section shall be made from the grades of rear admiral or captain on the active list of the navy: Provided further, That the pay of an admiral shall be $10,000 and the pay of a vice admiral $9000 per annum. Provided further, That in time of peace officers for the command of fleets and subdivisions thereof, as herein authorized, shall be designated from among the rear admirals on the active list of the navy: Provided further, That nothing herein contained shall create any vacancy in any grade in the navy or increase the total number of officers authorized by law: Provided further, That when an officer with the rank of admiral or vice admiral is detached from the command of a fleet or subdivision thereof, as herein authorized, he shall return to his regular rank in the list of officers of the navy and shall thereafter receive only the pay and

allowances of such rank: And provided further, That nothing in this act shall be held or construed as amending or repealing the provisions of Sections 1434, 1463, and 1464 of the Revised Statutes of the United States.

That the provision in the act approved March 3, 1915, for the designation of commanders-in-chief of certain fleets with the rank of admiral and for the designation of officers second in command of such fleets with the rank of vice admiral be, and the same is hereby, repealed.

Sec. 19. That Section 24 of the act entitled "An act to codify, revise, and amend the penal laws of the United States," approved March 4, 1909, as amended by an act entitled "An act making appropriation for the naval service for the fiscal year ending June 30, 1918, and for other purposes," approved March 4, 1917, be, and is hereby, amended by adding the following to said section:

"Provided, That offences hereunder committed within the Canal Zone or within any defensive sea areas which the President is authorized to establish by said section, shall be cognizable in the District Court of the Canal Zone, and jurisdiction is hereby conferred upon said court to hear and determine all such cases arising under said section and to impose the penalties therein provided for the violation of any of the provisions of said section."

Sec. 20. That hereafter all laws relating to the examination of officers of the navy for promotion shall be construed to apply to the regular advancement of staff officers to higher ranks on the active list the same as though such advancements in rank were promotions to higher grades: Provided, That examinations for such staff officers shall not be required except for such regular advancements in rank: that the President be, and he is hereby, authorized to direct the Secretary of the Navy to take such action on the records of proceedings of naval examining boards and boards of naval surgeons for the promotion of officers of the navy as is now required by law to be taken by the President.

Sec. 21. That during the continuance of the present war an extra allowance of one ounce of coffee or cocoa, two ounces of sugar, four ounces of hard bread or its equivalent, and four ounces of preserved meat or its equivalent shall be allowed to enlisted men of the deck force when standing night watches between eight o'clock postmeridian and eight o'clock antemeridian.—*Army and Navy Register*, 19/5.

THE INCREASE OF FLAG OFFICERS.—One of the most important provisions in the bill signed by the President on May 22 for the temporary increase of the personnel of the navy in Section 18, which empowers the President "to designate six officers of the navy for commands of fleets or subdivisions thereof," three of whom shall have the rank and pay of admiral and three others the rank and pay of vice admiral. The provision is doubly important at this time because it is flexible and is given added strength by Sections 6 and 14, and the proviso of Section 18 which enables the President to appoint officers to the two highest grades in the navy, from the grades of rear admiral or captain "in time of war." Under the law of August 29, 1916, only 10 commanders could be promoted to the grade of captain in any one year. Section 14 of the new law repeals this proviso without any qualification whatever. And Section 6 not only allows the Board of Rear Admirals to be convened "at such times and as the exigencies of the service may require," but also provides that "if nine rear admirals cannot be convened without injury to the service, six rear admirals may constitute the board and four of the members must concur in the recommendation instead of six as prescribed in said act," of August 29, 1916.

The logic of this new legislation is to be found not so much in the speedy promotion of Vice Admiral William S. Sims, admirable as that effect is, as in the opportunity it presents of adding younger men to our list of flag officers. Captains may be immediately ordered before the

Board of Rear Admirals for promotion in any number the President sees fit and there need be no waiting for the half-yearly examination, as was necessary under the law of August 29, 1916. Nor is there need for waiting until nine rear admirals can be assembled, for six will suffice and of these the concurrence of four in a recommendation will suffice for a promotion. It is not at all likely that the President will overdo the latitude allowed him under this law to promote captains, but there is no gainsaying the fact that it presents every opportunity for him to increase the number of younger flag officers in the navy if such a contingency becomes desirable.

It is a curious coincidence that the British Navy recently has been undergoing some such change as our new law affords our service. The *Army and Navy Gazette* of London says on this point, in its issue of May 5:

"The rumors which have been current for some time to the effect that it was intended to increase the 'flag list' were shown at the end of last week to be well founded. Apparently the increased numbers of the admirals, vice admirals and rear admirals respectively are one, two and six. By the Order in Council of December 8, 1903, the numbers were fixed at 12, 22 and 55, but by an Order in Council of September 30, 1914, these numbers were liable to be temporarily increased during hostilities. The need for younger admirals has been constantly urged, and as the establishment is manifestly elastic, it was difficult to understand why, if the need existed, it should not be supplied. As a result of the promotions which have recently taken place and the retirement of officers, in many cases voluntarily, from the higher ranks, something like 24 captains have now been advanced to flag rank, causing the net increase in rear admirals' list already mentioned. As a consequence of this upward movement the average age of the officers of rear admiral's rank has been slightly lowered, which is clearly an advantage. Taking all things into consideration, we have no great sympathy with the outcry for promotion by selection to the flag list, as we believe that the present regulations afford all the necessary facilities for making the requisite choice before a man's turn comes for advancement. The point lies in using the regulations with circumspection and fairness."—*Army and Navy Journal, 2/6.*

NAVY TO USE YALE BUILDINGS.—The Navy Department authorizes the following:

Yale University, in response to a request made by Secretary of the Navy Daniels, has agreed to the use this summer of its dormitories and dining rooms for men of the naval reserve. The university authorities asked that an officer be sent to New Haven to inspect the plant, and Secretary Daniels directed Rear Admiral N. R. Usher, commandant of the third naval district, to detail an officer to make the inspection and report at once as to the number of men who can be accommodated.

The navy now has at Harvard a school for training of radio operators. —*Army and Navy Register, 9/6.*

"SOLACE" REPORT.—The committee appointed by Secretary of the Navy Daniels to investigate the complaints of conditions aboard the hospital ship *Solace*, made in a "round robin" signed by 30 enlisted men, which was presented in the Senate by Senator Calder, reports that some of the charges are untrue and others grossly exaggerated; that, while the ship was over crowded at the time of the complaints, there was no lack of care or medical attendance; that the patients suffering with different infectious diseases were carefully segregated; that the regulations in regard to sanitation were observed, and that the entire ship, including blankets, dishes, etc., was sterilized after every trip to the hospital.

It concludes that "the round robin was composed by one person, who wove into it complaints from various sources," and that most of it "rests on gossip and hearsay."

The committee reports that there was "no lack of kindness and intelligent care" on the part of Dr. Blackwood, the medical director in command of the *Solace*, or his assistants; that "they were dealing with an unprecedented emergency, and in handling it they acquitted themselves admirably." It concludes that Surgeon General Braisted, Dr. Blackwood, and Dr. Pickerel, medical director in charge of the naval hospital, and their assistants are "all entitled to the highest praise for their devoted and untiring efforts and for the success which they achieved under extremely difficult conditions."

The committee, composed of Dr. William H. Welch, director of the school of public health, Johns Hopkins University; Dr. Abram Flexner, secretary of the general education board and author of "Medical Education in the United States and Europe," and Mr. Nathan Straus, the philanthropist, went to the fleet, where every opportunity for observation was afforded them, and spent an entire day on the *Solace* cross-questioning the members of the staff and the patients and examining into the conditions on the hospital ship. They visited one of the largest naval hospitals, training station, and navy yard, inspected the facilities and sanitary conditions, and individually interviewed all measles patients, sick or convalescent, who had at any time been aboard the *Solace*. They also made a careful inspection of two battleships.

"Altogether," the report states, "we had interviews with upwards of 100 patients who were aboard the *Solace* or had been aboard the *Solace*, either at the time of the round robin, shortly before, or shortly after. We did not know the names of the persons who signed the round robin. In the course of the inquiry we identified three of the signers, among them the person who undoubtedly composed the round robin and procured the signatures to it.

"Patients and convalescents were questioned in the absence of officers and attendants. We assured them their names would not be mentioned, and we encouraged them to speak freely for the good of the service. It is our judgment that the men spoke without reserve. Indeed, throughout our inquiry, both on the hospital ship *Solace* and at the naval hospital, we observed that the men felt entirely free to talk of conditions under which they were living. There was no evidence whatsoever of fear or constraint.

"The *Solace* is the only hospital ship in the navy at the present time," the report goes on to say. "Its normal capacity is 228 beds, of which 30 on the upper deck are set apart for communicable diseases. These 30 beds or bunks are arranged in three separate wards which do not communicate with one another, one ward having 8 beds, one 10, and one 12. Connected with each ward is a lavatory with a basin with running water, and two of the three wards have separate compartments for washing dishes and other vessels. As the measles ward has no such compartment, the dishes used in it are washed on the outside in large pans.

"The three wards just described are well ventilated and serve their purposes excellently under normal conditions. The main part of the hospital—that is, the medical and surgical wards and the operating rooms—are on the deck below and are models of their kind. The staff of the *Solace* consists of the medical inspector who is in command, assisted by an executive surgeon, an operating surgeon, an internist and specialist in genito-urinary diseases, a specialist in diseases of the eye, ear, nose, and throat, laboratory chief, a dentist, a pharmacist and assistants, and, finally, the so-called apprentices, who are male nurses.

"Following the declaration of war there was an enormous and very rapid increase of the personnel of the navy," the investigators point out. "Recruits from various parts of the country poured into the training camps and thence into the fleet—at Norfolk as many as 700 or more a day. Soon a fleet population of 25,000 was gathered there. The new recruits were especially susceptible to the common infectious diseases. It happened that measles, mumps, and to some extent scarlet fever and

cerebrospinal meningitis were more common and more widely distributed in the country at large than is usual at this time of year. The recruits passed through the training stations far more rapidly than in normal times, and under these conditions it was inevitable that there should be a large increase in the number of common infections. The existing facilities were therefore subjected to a tremendous strain.

"The war vessels had at once to transfer their infectious cases to the *Solace*," the report states. "The *Solace*, equipped to handle comfortably 30 infectious cases, had to handle at times more than three times that number. The pressure was most severe between the 18th and 21st of May, the dates covered by the round robin. On May 18 there were 72 infectious cases on board. Eight more were added on the 19th, 14 more on the 20th, and seven on the 21st—101 in all—over three times the normal capacity of the hospital ship. It was impossible for the *Solace* to avoid congestion by more frequently transferring patients to the naval hospital. In the first place the naval hospital was itself overtaxed, and the bungalows and the tents which now enable the hospital to accommodate a largely increased number of patients, had not then been sufficiently provided. Again, on account of its operating facilities and its facilities for taking care of non-contagious medical patients it was important that the *Solace* stay by the fleet, avoiding as long as possible the loss of the time required for the trip to the hospital and back. It may be added that within the last few days an ambulance transport previously arranged for has been provided for the purpose of carrying patients from the *Solace* to the naval hospital.

"Immediately upon the increase of the number of patients to be handled the staff of the *Solace* was increased to 70. Cots and army stretchers were as rapidly as possible provided, and tents were erected on deck. At no time was there the slightest relaxation in the enforcement of strict sanitary precautions, with a view to preventing the spread of infections. That the precautions taken were effective is evident from the fact that both on board the *Solace* and at the naval hospital cross infections have proved to be extremely rare."

The committee takes up seriatim the seven charges contained in the round robin and answers each separately, the charges and their conclusions being as follows:

"1. When we were sent from our ships, lying at different points in the fleet base, we were compelled to carry our own baggage, with fevers ranging from 100 to 103 degrees.

"We find that patients are brought in a launch from the various ships in the fleet to the *Solace*, those who are very ill lying on stretchers, others occupying seats in the launch. Three officers of the *Solace* stand at the head of the gangway to receive the patients. Those who are able to carry their own bags up the gangway do so; those who are unable to leave them to be removed subsequently by others. Occasionally they help one another. We were unable to find anyone, except the author of the round robin, who stated that the patients were compelled to carry their own baggage." Of the other two signers of the round robin, who, as has been said above, were identified, one stated that he 'knew of no general complaints about carrying bags'; that he himself 'was able to carry his own bag.' Another stated that he hardly felt sick at any time. The charge, therefore, of inhuman or unfeeling treatment in this respect is, in our judgment, absolutely untrue.

"2. Drinking water very scarce. I had three glasses while on board (C. K. E.), and some men had only one glass apiece. I might add that there was no ice water and the water was very warm.

"Under ordinary conditions on board the *Solace* water is kept in a water-cooler in each ward. This water has been cooled, but, except in very warm weather, does not contain ice. During the prevailing cool weather this spring the use of ice has not been considered necessary. For some unexplained reason the cooler in the measles ward was not in use during the period to which the round robin refers; instead, water was brought up by

the apprentice from time to time in pitchers or drawn by the patients from the faucet in the lavatory. Most of the persons interviewed stated that they got all the water they wanted, and that, in their judgment, no one needed to go without water. On the other hand, it is evident that the apprentice was so busy waiting on forty-odd persons that he was at times not able to serve water promptly. A patient who lay in a bunk close to the one occupied by the author of the round robin, and at the same time, stated he 'had plenty of water and whenever he wanted it.' Another referring to the same subject stated that he 'could get a drink within 5 or 10 minutes after asking for it' and that he 'did not always have to wait.' Sometimes he 'did not have to wait at all.' Several patients stated that sometimes 'the water was warm.' In our judgment, the charge in reference to the drinking water is grossly exaggerated, and the implication of lack of care is entirely undeserved.

"3. The dishes used by men sick with measles were washed in lavatory, where vessels were standing around with germs of scarlet fever and mumps, which said germs were thrown in same receptacle used by men with measles; the dishes, forks, and knives were wiped with toilet paper.

"Two of the three wards have small apartments for washing dishes and other utensils. The measles ward has no such apartment. Orders require that the dishes used in this ward be washed in large pans outside on the deck. It appears that occasionally some dishes were, contrary to orders, washed in the wash basin, but it was, in our opinion, exceptional and did not take place frequently enough to interfere with men who desired to use the basin for its proper purpose. In any case, the only dishes or vessels thus washed were dishes and vessels which had been used by men suffering with measles. The charge that 'vessels were standing around with germs of scarlet fever and mumps' in the measles compartment is impossible and absolutely absurd.

"4. All food was served to the men on one large platter, the motto of which was 'Help yourself or go without.'

"Men in bunks are served on trays. For those who are up and about food is brought on large platters, each platter containing a separate article of food. In our opinion, the method adopted in feeding patients is the only one practicable and is indeed entirely correct. We were unable to find a single patient, except the author of the round robin, who complained that he was unable to get food enough. The two other signers of the round robin, to whom we have already alluded, both reported that they themselves got food, but that they had 'heard' that there were others who failed to do so. The neighbor of the author of the round robin stated that food was brought to him regularly and abundantly. Many others declared that they had never heard any complaints on this subject. The general trend of the testimony and our own inspection indicates that there is an abundance of food of excellent quality.

"5. Men who were sick were compelled to sleep on the deck with blankets (two). Many of these men had high fevers.

"At the time of the greatest congestion, to which the round robin refers, patients slept (1) in bunks, (2) on cots, (3) upon army litters placed between the bunks. These litters rest on legs about 3½ inches high. Persons unaccustomed to the appearance of these litters might be deceived into thinking that those lying in them were lying on blankets on the deck. We found a few patients who stated that on the night of their arrival on the *Solace*, litters and cots having given out, they slept between blankets on the deck. As a matter of fact, under the circumstances, no special harm could have resulted, but we are persuaded that the charge applies to so few persons as to be practically negligible.

"A patient who entered the measles ward on May 17, and is still there, stated that he had 'never known or heard of anyone who slept on deck,' showing how very unusual this must have been. Another patient stated,

in reference to the 'litters,' 'to look at them you would think they were on deck.' This indeed seems to us the explanation of this charge.

"6. Blankets used by men with measles, mumps, and scarlet fever were piled up in one stack, and at night they were issued to the first ones who came for them. These blankets were not sterilized, and there were many risks taken by men of transferring disease to one another.

"This is much the most serious charge made—perhaps the only really serious one. We shall, therefore, discuss it very fully.

"In order to accommodate the overflow, four carefully separated tents were set up in the open deck space. One of these tents is used for mumps, another for measles, and another for scarlet fever. Most of these patients are up and about during the day, but those convalescent from different diseases are carefully kept apart. When these convalescents arise in the early morning they fold their blankets and place them at the foot of the cot; later apprentices and convalescents collect and pile the blankets separately. The author of the round robin stated that he himself 'saw blankets indiscriminately heaped in a single pile.' On inquiry it developed that the only occasion when he was out of the ward and on deck was on Sunday morning, May 20, about noon. He had, he said, left the ward for the purpose of hearing the music and had lain down on a cot in the measles tent on deck, where he remained an hour. At this time, according to his testimony, he saw apprentices and convalescents carrying blankets from the foot of the cots and making a single pile of them. As against this statement we have the otherwise unanimous statement of officers and scores of patients, who state that all those patients who were able to be up and about arose at 7 o'clock in the morning, folded their blankets, and had breakfast; and that the blankets were taken from the cots and piled up, at the latest, before 8 or 9 o'clock in the morning. Moreover, the author of the round robin pointed out to us the place where he lay on deck, from which place it was, as a matter of fact, impossible to see what he claims to have seen even if it were going on. The charge that blankets were not sterilized is absurd. Every time the *Solace* discharges its patients to the hospital the entire ship is sterilized, including blankets, dishes, etc. If the charge we are discussing were true, there would have been cross infection among the patients on the *Solace* and in the hospital. In this respect, however, the record of the *Solace* and the hospital seems to have been extremely good. The failure to develop cross infections is, therefore, in itself a complete answer to the charge.

"7. Sick men unable to wash themselves went without for length of trip on U. S. S. *Solace* to the hospital at Norfolk.

"We found two persons—the author of the round robin and one of the signers—who said they did not wash during the period of three to five days when they were on board the *Solace*, their explanation being that the washbasin in the measles ward contained dishes. With the exception of these two persons, we found no one who claimed that he was unable to wash, either for this or any other reason. The other signer of the round robin with whom we spoke testified that he washed every day, though he said he could not always get in the wash room when he wanted because there were so many other boys.

"Still another said: 'The basin was all right for washing almost any time,' and further that he 'had never heard any complaints about washing.' In our opinion, the two persons who stated that they were unable to wash properly found the lavatory occupied when they went to it for that purpose and simply failed to repeat the attempt at another time.

"Attention should also be directed to the fact that the 30 persons who signed the round robin do not apparently all claim to have knowledge of all the charges.

"The round robin was composed by one person, who wove into it complaints from various sources. The signers evidently did not mean indi-

vidually to indorse or stand for the whole of it. It is clear to us that most of it rests on gossip and heresay.

"In conclusion, we may state that the persons sick on the *Solace* and at the hospital are not afraid and do not hesitate to complain. The general testimony is to the effect that they received what they wanted, needed, and asked for. Every one of the signers of the round robin stated that 'the apprentice in the measles ward simply could not do any better than he did.' There was, in our judgment, no lack of kindness and intelligent care on the part of Dr. Blackwood and his assistants. They were dealing throughout the month of May with an unprecedented emergency, and in handling it they acquitted themselves admirably.

"In our judgment, Surgeon General Braisted, of the navy; Dr. Blackwood, the medical inspector in command of the *Solace*, and his staff, as well as Dr. Pickerel, medical director, in charge of the naval hospital, and his assistants are all entitled to the highest praise for their devoted and untiring efforts for the success which they achieved under extremely difficult conditions."

In connection with the report Secretary Daniels made the following statement:

"Not only do the findings of these three famous health experts clear the navy of a shameful attack, but they should carry a message of reassurance to the parents of the nation. The charge that sick sailors have been ill-treated and neglected, made in a round robin first receiving publicity through Senator Calder and then given country-wide circulation, is shown to have no other base than malice and falsehood.

"Dr. Welch, Dr. Flexner, and Mr. Straus not only investigated the *Solace*, but likewise studied conditions in the fleet and shore hospitals. The report is a testimonial to the humanity and efficiency of Surgeon General Braisted and the medical staff and methods of the navy.

"Too much importance cannot be attached to this unhappy incident. There is no more skillful appeal to the fears and prejudices of the population than attacks upon army and navy with regard to health measures, sanitation, and the treatment of the sick. The result is the same, whether reckless charges be inspired by sincerity or disloyalty. Enlistment is discouraged, popular confidence is weakened, and the very foundations of the national defence are sapped.

"The decisive manner in which these first attacks have been proved to be without foundation should serve as a warning to the people and a discouragement to future recklessness. The policy of the navy is one of absolute openness. We have nothing to conceal. All that we ask is this: That before wide publicity is given to brutal charges, some slight attempt be made to ascertain their truth."—*Army and Navy Register*, 9/6.

PAY OF CAPTURED GERMAN OFFICERS.—The United States has proposed to Germany through the Spanish Government that each country agree to grant to military and naval officers of the other country who may be taken prisoners of war the same rate of pay as officers of corresponding rank in the capturing forces received.

The second Hague convention provides that "officers taken prisoners shall receive the same rate of pay as officers of corresponding rank in the country where they are detained. the amount to be ultimately refunded by their own government." Both the United States and Germany are signatories of this article, but there is great question if any of the Hague agreements are still in force.

The German sailors taken from the interned German war vessels in this country are to be paid at the rate of American seamen in accord with the original plan announced by the Navy Department. It is uncertain what the pay of officers will be.

The big difference in pay between American and German officers will probably be a matter of adjustment, as, if German officers captured by this

country are paid at the American scale, their government would have to refund much more than they pay their men at home.—*Washington Star*, 14/6.

NEW RATINGS AND PAY INCREASE RECOMMENDED.—Declaring the war had shown the necessity for a revision of ratings and of pay schedules in the navy, Secretary Daniels has written Speaker Clark calling attention to various recommendations for such changes made by the department in the past, and adding several new suggestions for pay increases and creation of new ratings.

From those at present in the rank of machinists' mate the Secretary recommends that there be designated two new ratings, to be known as enginemen, first class, and enginemen, second class, with pay of $45 and $40 a month, respectively. Creation of a first and second class rating for coppersmiths and blacksmiths also is asked, the pay of each to be $65 for the first class and $50 for the second. Other new ratings recommended are patternmaker, first class, with pay of $65; patternmaker, second class, $50; moulder, first class, $65; moulder, second class, $50; chief special mechanic, $127, and special mechanic, first class, $80.

An increase of $10 a month in the pay of yeomen showing particular proficiency is asked. It also is recommended that the pay of machinists' mates, second class, and that of water tender is increased from $40 to $45 a month.—*N. Y. Herald*, 15/6.

NATIONAL GUARD ARMY.—The *Times* herewith presents a summarization of the plan by which the War Department hopes to form an effective fighting force of more than 400,000 men through the expansion of the National Guard under the authority given in the National Defence act of June 3, 1916.

Under that act the National Guard may be expanded through enlargement of existing units and the formation of new units until it reaches a total of 433,800, including naval militia. This force is to be formed on the basis of 800 guardsmen for each Senator and Representative. For the 531 Senators and Representatives this allotment would give 424,800 men. Adding 9000 for the insular possessions, and subtracting 24,700 reserved for the naval militia, gives a total of 409,100 for the National Guard. There are now fewer than 200,000 in the guard. To obtain the increase the present units will be raised to full strength and new units formed.

In accordance with President Wilson's orders, Brig. General William A. Mann of the General Staff, as Chief of the Division of Militia Affairs, has sent to each adjutant general complete information about the quota assigned for each state, the units to be comprised, and the order in which the units shall be organized.

The War Department's plan, showing the divisions to which each state's quota will be assigned and the quota of each state, follows:

FIFTH DIVISION

(Comprising Maine, New Hampshire, Massachusetts, Connecticut, Rhode Island, and Vermont)

Maine

Allotment, 4800; less naval militia, 600.

A—To coast artillery: Thirteen companies, with headquarters.

B—To coast artillery supports: One regiment infantry.

C—To army corps troops: One regiment field artillery, heavy, three battalions of two batteries each; two field hospital companies, two ambulance companies, one telegraph battalion, signal corps.

New Hampshire

Allotment, 3200.

A—To coast artillery: Four companies, with headquarters.

B—To fifth National Guard infantry division: One regiment of infantry, one machine-gun troop of cavalry, one supply train, one field hospital company.

C—To army corps troops: Two battalions field artillery, heavy, battalions of batteries; One outpost company, signal corps; one wire company, signal corps.

Massachusetts

Allotment, 14,400; less naval militia, 1800.

A—To coast artillery: Twelve companies, with headquarters.

B—To fifth National Guard infantry division: One brigade headquarters detachment, field artillery; three regiments field artillery, one regiment engineers, two brigade headquarters detachments, infantry; five regiments infantry, one division headquarters troop and enlisted personnel, one headquarters train, one engineers' train; sanitary, one headquarters, two field hospitals, two ambulance companies.

C—To cavalry division: One regiment of cavalry. (Organization of this regiment not desired at this time. The existing National Guard squadron of cavalry will be incorporated in the cavalry regiment for the fifth division as the first squadron.)

Connecticut

Allotment, 5600; less naval militia, 700.

A—To coast artillery: Thirteen companies, with headquarters.

B—To fifth National Guard infantry division: One brigade headquarters detachment, two regiments of infantry, one squadron cavalry, designated as third squadron, provisional cavalry regiment; sanitary, one field hospital company, one ambulance company.

C—To army corps troops: One battalion field artillery, heavy, of two batteries, one radio company, signal corps.

Rhode Island

Allotment 4000, less naval militia, 500.

A—To coast artillery, twenty companies with headquarters.

B—To fifth National Guard infantry division, one squadron cavalry (designated as second squadron, provisional regiment), sanitary, one ambulance company.

C—To army corps troops, one regiment of field artillery, heavy, regiment of three battalions, each of two batteries.

Vermont

Allotment, 3200.

A—To fifth National Guard infantry division, one regiment of infantry, one squadron of cavalry. (Organization of cavalry squadron not desired at present; one infantry battalion should be organized in its place.)

B—To army corps troops, one regiment of field artillery, three battalions of two batteries (field artillery regiment to be organized first). Sanitary, one headquarters of trains, two field hospital companies, two ambulance companies.

SIXTH DIVISION

(Comprising New York)

New York

Allotment, 36,000; less naval militia, 4500.

A—To Coast Artillery: Thirty-six companies, with headquarters.

B—To sixth National Guard infantry division: One division headquarters; three brigade headquarters detachments; nine regiments of infantry; one regiment of cavalry; one regiment of engineers; one field battalion, signal corps; one headquarters of trains; one ammunition train;

one supply train; one engineer train. Sanitary: One headquarters, four field hospital companies; four ambulance companies.

C—To cavalry division: One regiment of cavalry. (Completion of this regiment not desired at present.)

D—To army corps troops: One brigade headquarters detachment field artillery; three regiments of field artillery.

E—To coast artillery supports: One brigade headquarters detachment; four regiments of infantry.

SEVENTH DIVISION

(Comprising Pennsylvania)

Pennsylvania

Allotment, 30,400, less naval militia, 1000.

A—To seventh National Guard infantry division: One division headquarters; three brigade headquarters detachments; nine regiments infantry; one regiment cavalry; one brigade headquarters detachment field artillery; three regiments field artillery; one regiment engineers; one field battalion signal corps; sanitary, one headquarters of trains, four field hospital companies, four ambulance companies, one headquarters of trains, one ammunition train, one supply train, one engineer train.

B—To coast artillery supports: Three regiments infantry.

C—To army corps troops: One brigade headquarters detachment; three regiments field artillery, heavy, of three battalions of two batteries each; one telegraph battalion, signal corps; one field battalion, signal corps.

D—To cavalry division (organization of units of this division not desired at this time): One regiment cavalry; one regiment field artillery, horse; one battalion engineers; one field battalion, signal corps; one engineer train; sanitary, one headquarters and three field hospital companies, three ambulance companies.

EIGHTH DIVISION

(Comprising New Jersey, Delaware, Maryland, District of Columbia and Virginia)

New Jersey

Allotment, 11,200, less naval militia, 1400.

A—To coast artillery: Four companies with headquarters.

B—To eighth National Guard infantry division: One regiment field artillery, one battalion of engineers, one outpost company of signal corps, one radio company of signal corps, one brigade headquarters detachment, three regiments of infantry, one squadron of cavalry, designated as first squadron.

Sanitary—One headquarters, one field hospital company, one ambulance company, one division headquarters troop and enlisted personnel, division headquarters.

C—To army corps troops: One regiment field artillery, heavy, regiment of three battalions of two batteries each.

D—To coast artillery supports: Two regiments of infantry.

Delaware

Allotment, 2400.

A—To coast artillery: Four companies, with headquarters.

B—To eighth National Guard infantry division: One battalion engineers, one headquarters train, one ammunition train; one supply train; one engineer train; one ambulance company.

C—To coast defence supports: One battalion of infantry.

Maryland

Allotment, 6400, less naval militia, 700.

A—To coast artillery: Six companies, with headquarters.

B—To eighth National Guard infantry division: One brigade headquarters detachment, three regiments infantry, one machine gun troop cavalry, one battalion field artillery, one field hospital, one ambulance company.

District of Columbia

Reserved for naval militia, 400.

A—To coast artillery: Two companies, with headquarters.

B—To eighth National Guard infantry division: One battalion field artillery, one squadron cavalry (third squadron), one wire company signal corps; sanitary, one field hospital company.

C—To coast defence support: One regiment infantry.

Virginia

Allotment, 9600.

A—To coast artillery: Ten companies, with headquarters.

B—To eighth National Guard infantry division: One brigade headquarters detachment, three regiments of infantry, one squadron cavalry (designated as second squadron), one regiment field artillery.

C—To cavalry division: One regiment of cavalry (cavalry division organizations not desired for present).

D—To army corps troops: One regiment field artillery, heavy; two battalions of three batteries each, one field battalion signal corps.

NINTH DIVISION

(Comprising North Carolina, South Carolina and Tennessee)

North Carolina

Allotment, 9600; less naval militia, 450.

A—To coast artillery: Six companies with headquarters.

B—To ninth National Guard infantry division: One infantry brigade headquarters detachment; three regiments infantry; one squadron cavalry, designated as first squadron cavalry, provisional regiment; one machine gun troop cavalry; one brigade headquarters detachment, field artillery; one regiment field artillery; one battalion engineers; one radio company, signal corps; one headquarters train; one supply train; one engineer train; sanitary, one field hospital company, one ambulance company; one division headquarters troop, and enlisted personnel.

C—To army corps troops: One regiment field artillery, heavy; three battalions of two batteries each.

D—To cavalry division: One regiment cavalry (not to be organized at present).

South Carolina

Allotment, 7200, naval militia, 500.

A—To coast artillery: Five companies with headquarters.

B—To ninth National Guard infantry division: One infantry brigade headquarters detachment, three regiments of infantry, one squadron of cavalry (designated as second squadron, provisional cavalry regiment); one regiment field artillery, one battalion engineers, one outpost company, signal corps; one ammunition train, one field hospital, one ambulance company.

Tennessee

Allotment, 9600.

A—To ninth National Guard infantry division: One brigade headquarters detachment, three regiments infantry, one squadron cavalry, designated

as third squadron, provisional regiment; one regiment field artillery, one wire company signal corps, sanitary, one headquarters, two ambulance companies, two field hospital companies.

B—To army corps troops: one regiment field artillery, heavy, regiment of three battalions of two batteries each; one telegraph battalion, signal corps, one field battalion, signal corps.

C—To cavalry division (not to be organized at present); one regiment cavalry, one headquarters train, one ammunition train, one supply train.

TENTH DIVISION

(Comprising Alabama, Georgia and Florida)

Alabama

Allotment, 9600.

A—To coast artillery: Four companies with headquarters.

B—To tenth National Guard infantry division: One infantry brigade headquarters detachment, three regiments infantry, one regiment cavalry, one regiment field artillery, one battalion engineers, one radio company, one radio company signal corps, one ammunition train; sanitary, one field hospital company, two ambulance companies.

C—To army corps troops: One regiment field artillery, heavy, regiment of three battalions of two batteries each.

D—To cavalry division: One regiment cavalry (not to be organized at present).

Georgia

Allotment, 11,200.

A—To coast artillery: Four companies with headquarters.

B—To tenth National Guard infantry division: One brigade headquarters detachment, four regiments infantry, one brigade headquarters detachment field artillery, one regiment field artillery, one battalion field artillery, one battalion engineers, one wire company signal corps; sanitary, one headquarters, two field hospital companies, two ambulance companies, one headquarters of trains, one supply train, one engineer train, one division headquarters troop and enlisted personnel.

C—To cavalry division: One regiment cavalry (not to be formed at present).

D—Two army corps troops: One regiment field artillery.

Florida

Allotment, 4800, less naval militia, 700.

A—To coast artillery: Eight companies with headquarters.

B—To tenth National Guard infantry division: Two regiments infantry, one battalion field artillery, one field hospital company, one infantry brigade headquarters detachment.

ELEVENTH DIVISION

(Comprising Michigan and Wisconsin)

Michigan

Allotment, 12,000; less naval militia, 1000.

A—To eleventh National Guard infantry division: One brigade headquarters detachment, four regiments infantry, one regiment field artillery, one battalion engineers, one field battalion signal corps; sanitary, one headquarters train, four field hospital companies, four ambulance companies, one headquarters train, one ammunition train, one supply train, one engineer train.

B—To cavalry division: One regiment cavalry (completion of cavalry regiment other than organization of two additional troops for first squadron not desired now).

C—To army corps troops: Two regiments field artillery, heavy; three battalions of three batteries each, one telegraph battalion signal corps.

Wisconsin

Allotment, 10,400.

A—To eleventh National Guard infantry division: One battalion engineers, one artillery brigade, headquarters detachment; two regiments field artillery, one regiment cavalry, two infantry brigades, headquarters detachments; five regiments infantry, one division headquarters troop, with enlisted personnel, division headquarters.

B—To army corps troops: Two field hospital companies, two ambulance companies.

TWELFTH DIVISION

(Comprising Illinois)

Illinois

Allotment, 23,200, less naval militia, 2900.

A—To twelfth National Guard infantry division, one regiment engineers, one brigade field artillery, one field battalion, signal corps, three infantry brigade headquarters detachments, nine regiments infantry, one field artillery brigade headquarters detachment, one headquarters train, one ammunition train, one supply train, one engineer train, one sanitary train complete, and one division headquarters troop and enlisted personnel.

B—To army corps troops, one regiment field artillery.

C—To cavalry division, one regiment cavalry (not to be organized yet).

THIRTEENTH DIVISION

(Comprising Minnesota, North Dakota, South Dakota, Iowa and Nebraska)

Minnesota

Allotment, ——.

A—To thirteenth National Guard infantry division: One infantry brigade headquarters detachment, three regiments infantry, one battalion engineers, two regiments field artillery, one radio company, signal corps, one headquarters train, one engineer train.

B—To army corps troops, two battalions heavy field artillery.

North Dakota

Allotment, 4000.

A—To thirteenth National Guard infantry division, two regiments of infantry.

B—To army corps troops, one field hospital company and one ambulance company.

South Dakota

Allotment, 4000.

A—To coast artillery supports: One regiment infantry.

B—To army corps troops: One field hospital company, one ambulance company.

C—To cavalry division: One regiment cavalry not to be organized yet.

Iowa

Allotment, 10,400.

A—To thirteenth National Guard infantry division: One battalion engineers, two regiments field artillery, one outpost company signal corps, one regiment cavalry, one infantry brigade headquarters detachment, three

regiments infantry, one ammunition train, one headquarters sanitary train, two field hospital companies, two ambulance companies, one division headquarters troop and enlisted personnel, of headquarters of division.

B—To army corps troops: One battalion field artillery, heavy, of two batteries.

C—To coast artillery supports: One regiment infantry.

Nebraska

Allotment, 6400.

A—To thirteenth National Guard infantry division: One infantry brigade headquarters detachment, three regiments infantry, one wire company signal corps, two field hospital companies, two ambulance companies.

B—To army corps troops: One regiment field artillery, heavy, regiment of three battalions of two batteries each.

FOURTEENTH DIVISION

(Comprising Kansas and Missouri)

Kansas

Allotment, 8000.

A—To fourteenth National Guard infantry division: One brigade headquarters detachment, three regiments infantry, one regiment field artillery, one battalion engineers, two field hospital companies, two ambulance companies, one ammunition train, one engineer train.

B—To army corps troops: One field battalion signal corps.

C—To cavalry division: One regiment cavalry.

Missouri

Allotment, 14,400, less naval militia, 300.

A—To fourteenth National Guard infantry division: Two regiments field artillery, one battalion engineers, one headquarters sanitary train, two field hospital companies, two ambulance companies, one field battalion signal corps, two brigades headquarters detachments, six regiments infantry, one regiment cavalry, one supply train, one headquarters train, one field artillery brigade headquarters detachment.

B—To cavalry division: One regiment cavalry (not to be organized now), one regiment field artillery, horse; one battalion engineers, mounted; one field battalion signal corps, one engineer train.

FIFTEENTH DIVISION

(Comprising Texas and Oklahoma)

Texas

Allotment, 16,000; less naval militia, 500.

A—To Coast Artillery: Five companies with headquarters.

B—To fifteenth National Guard infantry division: One battalion of engineers; two regiments field artillery; one regiment cavalry; one field battalion, signal corps. Sanitary: One headquarters, two field hospital companies, two ambulance companies; seven regiments infantry; two brigade headquarters detachments; one headquarters train; one supply train, one engineer train; one division headquarters troop and enlisted personnel.

C—To cavalry division: One regiment cavalry (not desired now).

Oklahoma

Allotment, 8000.

A—To fifteenth National Guard infantry division: One regiment field artillery; one battalion engineers; two field hospital companies; two ambulance companies; three regiments infantry; one ammunition train; one brigade headquarters detachment.

B—To army corps troops: One regiment field artillery, heavy; three battalions of two batteries each.
C—To cavalry division: One regiment cavalry (not desired yet).

SIXTEENTH DIVISION

(Comprising Ohio and West Virginia)

Ohio

Allotment, 19,200, less naval militia, 2400.
A—To sixteenth National Guard infantry division: Two regiments field artillery; one regiment engineers; one battalion signal corps; two brigade headquarters detachments; six regiments infantry; one regiment cavalry; one sanitary train, complete; one engineer train; one detachment brigade headquarters field artillery; one headquarters troop and enlisted personnel division headquarters.
B—To coast artillery supports: Three regiments infantry.

West Virginia

Allotment, 6400.
A—To sixteenth National Guard infantry division: One brigade headquarters detachment; three regiments infantry; one regiment field artillery; one headquarters train; one ammunition train; one supply train.
B—To army corps troops (sanitary): One headquarters train; two field hospital companies; two ambulance companies.

SEVENTEENTH DIVISION

(Comprising Kentucky and Indiana)

Kentucky

Allotment, 10,400.
A—To seventeenth National Guard infantry division: One regiment field artillery; one battalion engineers; one field battalion signal corps; one sanitary train, complete; one brigade headquarters detachment; four regiments infantry; one headquarters train; one ammunition train.
B—To army corps troops: One regiment field artillery, heavy; three battalions of two batteries each.
C—To cavalry division: One regiment cavalry (not desired yet).

Indiana

Allotment, 12,000.
A—To seventeenth National Guard infantry division: Two regiments field artillery, one battalion engineers, one regiment cavalry, two brigade headquarters detachments; five regiments infantry, one brigade headquarters detachment, field artillery; one supply train, one engineer train, one headquarters troop and enlisted personnel, division headquarters.
B—To army corps troops: One regiment field artillery, heavy; three battalions of two batteries each, one field battalion signal corps, one sanitary train complete.

EIGHTEENTH DIVISION

(Comprising Arkansas, Mississippi and Louisiana)

Arkansas

Allotment, 7200.
A—To eighteenth National Guard infantry division: One brigade headquarters detachment, three regiments infantry, one regiment field artillery, one outpost company, signal corps; sanitary, one field hospital company, one ambulance company, one headquarters train, one ammunition train.
B—To cavalry division: (Not to be organized yet); sanitary, one field hospital company, one ambulance company.

Mississippi

Allotment, 8000.

A—To eighteenth National Guard infantry division: One battalion engineers; two squadrons cavalry; one machine gun troop cavalry; one regiment field artillery; one radio company, signal corps; one brigade headquarters detachment; three regiments infantry; sanitary, one headquarters, two field hospital companies, two ambulance companies; one supply train; one engineer train.

B—To cavalry division (not desired yet): Sanitary, one headquarters, one field hospital company, one ambulance company.

Louisiana

Allotment, 8000, less naval militia, 650.

A—To coast artillery: Four companies with headquarters.

B—To eighteenth National Guard infantry division: One regiment field artillery; one battalion engineers; one squadron cavalry; one wire company, signal corps; one field hospital company; one ambulance company; three regiments infantry; one brigade headquarters detachment; one headquarters troop and enlisted personnel division headquarters.

C—To cavalry division (not desired yet): One field hospital company, one ambulance company.

NINETEENTH DIVISION

(Comprising California, Utah, Arizona, Colorado, New Mexico and Nevada)

California

Allotment, 10,400, less naval militia, 1300.

A—To coast artillery: Twenty-four companies, with headquarters.

B—To nineteenth National Guard infantry division: One brigade headquarters detachment; three regiments infantry; one regiment field artillery; one battalion engineers; one field battalion, signal corps; one squadron cavalry; one machine gun troop cavalry; sanitary, one headquarters, two field hospital companies, three ambulance companies; one headquarters troop, and enlisted personnel division headquarters.

Utah

Allotment, 3200.

A—To nineteenth National Guard infantry division: One regiment field artillery; one field hospital company; one ambulance company; one headquarters train; one ammunition train; one supply train.

B—To cavalry division: One regiment cavalry.

Arizona

Allotment, 2400.

A—To nineteenth National Guard infantry division: One regiment infantry; one squadron cavalry.

Colorado

Allotment, 4800.

A—To nineteenth National Guard infantry division: One battalion field artillery; one battalion engineers, two regiments infantry, one squadron cavalry, one brigade headquarters detachment, one field hospital company, one engineer train.

B—To cavalry division (not desired yet): one headquarters train, one ammunition train, one supply train.

New Mexico

Allotment, 2400.

A—To nineteenth National Guard infantry division: One battalion field artillery, one regiment infantry.

B—To cavalry division: Two squadrons cavalry, one machine gun troop cavalry.

Nevada

Allotment, 2400.

A—To nineteenth National Guard infantry division: One regiment infantry.

B—To cavalry division: One squadron cavalry.

TWENTIETH DIVISION

(Comprising Washington, Oregon, Montana, Idaho and Wyoming)

Washington

Allotment 5600, less naval militia, 700.

A—To coast artillery: twenty companies with headquarters.

B—To twentieth National Guard infantry division: One regiment infantry, one regiment field artillery, one battalion engineers, one field battalion signal corps, one field hospital company, one ambulance company, one squadron cavalry, one machine gun troop cavalry, one headquarters troop and enlisted personnel for division headquarters.

Oregon

Allotment 4000, less naval militia, 500.

A—To coast artillery: Twelve companies, with headquarters.

B—To twentieth National Guard infantry division: One regiment infantry, one battalion field artillery, one battalion engineers, one field hospital company, one ambulance company, one squadron cavalry.

Montana

Allotment, 3200.

A—To twentieth National Guard infantry division: One brigade headquarters detachment (to be organized only after two infantry regiments are completed); two regiments infantry, one squadron cavalry, sanitary; one headquarters, one field hospital company, one ambulance company.

Idaho

Allotment, 3200.

A—To twentieth National Guard infantry division: Two regiments infantry, one brigade headquarters detachment, one field hospital company, one ambulance company, one headquarters train, one engineer train.

Wyoming

Allotment, 2400.

A—To twentieth National Guard infantry division: One regiment infantry, one battalion field artillery, one ammunition train, one supply train.—*N. Y. Times*, 22/5.

NATIONAL ARMY.—Plans for the formation of the new army have been completed. It will be divided into 16 divisions, each to consist of 28,000 men. They will be mobilized in 16 concentration camps, the names of which will soon be announced. The draft army will be officially known as the National Army, in contradistinction to the regular army and the National Guard army. These National army divisions will be numbered consecutively from one to 16.

New York and Pennsylvania will furnish enough men in the draft to form three National Army divisions, exclusive of what they will furnish for the regular army and the National Guard army. New York and Pennsylvania will each furnish about a division and a half for the National Army. The only other state to furnish as much as a division for the National Army will be Illinois. Seven Pacific Coast states, where the population is not so dense, will furnish the sixteenth National Army division.

Distribution of Divisions.—The distribution of divisions, according to the states that will form them, will be as follows:

First—Massachusetts, Maine, Connecticut, Rhode Island, Vermont, and New Hampshire.

Second—Lower New York State and Long Island.

Third—Upper New York State and Northern Pennsylvania.

Fourth—Southern Pennsylvania.

Fifth—Virginia, Maryland, Delaware, New Jersey, and District of Columbia.

Sixth—Tennessee, North Carolina, and South Carolina.

Seventh—Alabama, Georgia and Florida.

Eighth—Ohio and West Virginia.

Ninth—Indiana and Kentucky.

Tenth—Wisconsin and Michigan.

Eleventh—Illinois.

Twelfth—Arkansas, Mississippi, and Louisiana.

Thirteenth—North Dakota, South Dakota, Nebraska, Minnesota, and Iowa.

Fourteenth—Colorado, Kansas, and Missouri.

Fifteenth—Arizona, New Mexico, Texas, and Oklahoma.

Sixteenth—Washington, Oregon, Idaho, Montana, California, Nevada, and Utah.—*N. Y. Times,* 18/5.

SUBMARINES

LIMITATIONS OF SUBMARINES DESCRIBED BY VICE ADMIRAL SIMS.—The views of Vice Admiral Sims on the limitations of submarines must be of intense interest at this time when that type of vessel is absorbing so much attention and when he is now engaged in attacking them with American destroyers.

It was preceding the declaration of war that Admiral Sims was called to testify before the House Naval Committee. At that time he was commanding the new superdreadnought *Nevada.* He said to the committee:

"Upon the invitation of clubs I have spoken before many audiences on the characteristics of the submarine, and I have found an almost complete misapprehension of what a submarine is and what it can do. They were not aware, for example, that a submarine can only steam for a short distance underneath the water, depending upon its size, from say, 40 to 50 or 60 miles, that, having steamed that distance, it must come to the surface and stay three or four or five hours, according to the size, to recharge its batteries.

"A submarine cannot operate safely at all in the presence of surface boats of the enemy in less than a certain depth of water. The submarine itself, practically independent of its size, whether it is of 300 tons or 1000 tons, draws about the same amount of water, from the bottom of its keel to the top of the periscope, usually about 40 odd feet—they do not differ more than 2 or 3 feet—and the consequence is that in the presence of enemy surface boats the submarine must operate in water deep enough to enable her to go down to a considerable distance without striking the bottom; that is, she must have water of from 60 to 70 feet depth. The speed of a submarine under the water is slow—anywhere from 8 to 10 knots for the average submarine.

"The consequence is that a naval force that commands the surface of the sea can counteract almost entirely the attack of submarines, because the submarine cannot go very far under the surface. She must do most of her travelling on the surface. She can be seen from a very considerable distance from the high decks of ships, and if she is seen and there are a considerable number of surface craft of the enemy in her neighborhood she is immediately in very great danger.

"For example, a submarine is seen in a certain position at 6 o'clock in the morning, and that information is flashed out on the wireless, giving her latitude and longitude. Then it is known that by 7 o'clock in the morning she cannot be outside a certain circle drawn, we will say, with a radius of 8 or 10 miles from that point, and at 8 o'clock in the morning she cannot be outside of a certain other larger circle, so that vessels stationed in the neighborhood, that can be called in by wireless, form themselves in a line and sweep across the circle, and that submarine has to proceed under water, for, having been seen she must immediately go down to avoid the gun-fire from the vessel which first sighted her, and must either move under the water or else go down to the bottom and rest there, which she can do only if the water is not over 200 feet deep, with the hope that they will not find her.

"If she travels along under the water with periscope submerged, she disturbs the surface of the water, the regular form of the waves on the surface, by passing along underneath the surface, so that you can often see this disturbance proceeding like a wake, and it can from the high bridge of a ship, or from a hydroplane, be particularly well seen. Then two destroyers of the enemy will so cross ahead of the submarine's 'wake' and throw out a net, and of course, the submarine cannot know that as she cannot see, and if she runs into the net, from that time on her capture is certain, because the net itself is made for the purpose of keeping track of her.

"We did not find out for a long time what those nets are like, and I think it is necessary that it should be understood in order to realize the great danger submarines run in the presence of light surface craft. The net is a very light one made of wire rope, probably not as big as a lead pencil, probably not more than a quarter of an inch in diameter. The meshes of the net are 12 or 15 feet square. On the top of this net are floats and on the bottom are little weights. The moment this net is in the water in front of the submarine the floats keep the net on the surface and the weights keep the bottom down, and if she runs into it her bow goes into one of the meshes and the net falls back around her, and it may foul her propeller or may not. The net is 300 or 400 yards long, and as the submarine proceeds, the floats will trail on the surface, so that even if she dives deeper she leaves these on the surface, her trail is plain, and there is no difficulty then in capturing her. She knows when she runs into a net that her capture is practically certain. If she does down 200 feet the floats of the net are still on the surface.

"Of course," the admiral added, "the submarine has no idea that destroyers are around, and when these run in and begin to pay the net out in front of the submarine's wake, the submarine comes along and sticks her nose in one of the meshes of the net, and from that time on her position is shown on the surface by the floats of the net. She must eventually come up, and when she does she will be captured or destroyed. The net is coiled like a seine and is kept in a trough on the after deck of the destroyer. You pay it out, and away it goes, the pressure of the water pulling it out. It is not difficult to handle. Those are only some of the means they have used on the other side to counteract the attack of submarines, or to capture or destroy them. They have proved so dangerous to submarines that the latter do not venture into certain guarded areas at all.

"It is said that a captain of a submarine proceeding through the North Sea saw that he was dragging buoys behind him, and he knew what that meant. The point is that, if the submarine goes down and stays on the bottom, the net marks her place and her enemies can lower a bomb and blow her up. In order to guard channels or place snares for the submarines a net is used similar in all respects, except that it has anchors at the bottom and weight enough to carry it to the bottom, and the buoys hold it up, so that it remains vertical in the water. The weights on the bottom are attached to it by lines that are lighter than the wire of which

the net is made, so that a submarine running into it rips it loose from its anchors, and it becomes entangled on the submarine, and the floats come to the surface and show the submarine's position.

"That is the reason there has been so little execution by submarines in the British Channel. Of course, they have nets across the Channel, like those described, also some strong ones that will stop a submarine. Owing to this protection, troop transports have been passing back and forth across the English Channel.

"Similar defences hold good to some extent out in the open sea when attacks on an enemy fleet are planned. If the fleet is accompanied by a large number of destroyers and trawlers or any surface craft, so that it commands the surface in the neighborhood, backed up by heavy ships that can chase off anything that wants to interfere with the light vessel, it is almost impossible for a submarine to get through the screens about the fleet.

"The British fleet spends approximately half of its time at sea. When it is not in port it is in some deep indentation of the coast, across which nets are thrown, so that it will not be bothered.

"The fleet comes out in battle formation. The order of steaming is the order of battle, as they call it. It is surrounded by one or two circles of destroyers about 10 miles away. About 20 or 30 miles further out there is a circle of cruisers. Between these two lines are a number of smaller boats that make the speed of the fleet—it requires 17 or 18 knots, or something of that kind—and the fleet steams at full speed all the time it is out, and changes its course with great frequency. At a signal from the wireless the course is often changed 90 degrees. No submarine has ever penetrated that screen around the fleet, so far as we know, except in one instance, and in that case one submarine dived, came up inside, and was promptly run down by a battleship.

"On that occasion the officer of the deck on the battleship saw the submarine, and immediately altered his course and ran it down. It was the same submarine that sunk the *Cressy*, *Hogue*, and *Aboukir*. The only reason for mentioning these things is to bring out this feature: that the idea of having a small submarine, based on a shore base, to prevent a fleet from coming in, is entirely wrong.

"One does not hesitate to say that if there were a hundred submarines based on New York, a fleet could come in to the westward and make its way to a position from which it could shell New York City with practically no danger of being interfered with by submarines, provided it controlled the surface of the sea. Of course such a fleet is assumed to be so powerful that it cannot be chased away, its scouting line more powerful than any we can send against it, and the trawlers and destroyers surrounding it an effective screen against submarines.

"As the small 'coast defence' submarine cannot go more than about 40 miles under water, she must come up after covering this distance or go to the bottom. She is helpless as regards attack against the screened fleet, and, in all probability would be destroyed by one of the methods described." —*N. Y. Times*, 20/5.

FRENCH DEFENCE AGAINST SUBMARINES.—Replying to interpellations on submarine warfare May 25 in the public session of the Chamber of Deputies, Rear Admiral Lacaze, the Minister of Marine, gave an interesting outline of the means of defence France has adopted against the undersea boats.

"I see no reason why I should not speak of these methods in public," said Admiral Lacaze. "It would be childish to think they are unknown to the enemy. They consist of a system of patrol boats, of arming merchantmen with guns, and fitting them with wireless; of seaplanes, nets, mines, smoke-raising devices, and dragnets.

"I sought to get patrol boats built here and buy them abroad. I scoured the world over with missions, covering the ground from America to North Cape, from the Cape of Good Hope to Japan, but England had been beforehand. When I entered the Ministry I found 243 patrols. Now we have 552." (A Socialist voice: "It is formidable.")

"I do not say it is formidable," continued the Minister, "nor even sufficient, and I have drawn up a scheme which will increase the figure up to 900. I continue to buy in London, the world's center for shipping. I am obliged to do so because our shipyards had been almost completely abandoned; because, as a result of that short-war theory which weighed so regrettably upon all decisions taken at the outset of the war, the yards had been transformed into raw material factories to meet the pressing need of the national defence. We have now got back most of the arsenals and a number of private yards, together with skilled workmen.

"The guns we mount on the patrol boats have been referred to disdainfully, but you cannot put 10-centimeter guns on a small vessel. A patrol boat on guard, armed with 95-millimeter guns, met two submarines armed with 105-millimeter guns, sank one and put the other to flight.

"We have 1200 dragnets as well as 170,500 curtain nets and five thousand 20-foot float nets, which indicate the presence of submarines. We have special bombs for submarines and apparatus to throw them.

"We have organized seaplane posts all around the coast, so that the zone of action of each post joins that of its neighbor on either side. By October all merchantmen and patrollers will be fitted with wireless and all merchantmen supplied with guns of as heavy caliber as possible, for which measures programs have been drawn up even beyond what was thought possible.

"For building the plates and frames required, M. Loucheur, Under Secretary for Munitions in charge of the manufacturing sections, has started up again all the rolling mills. They will be able to supply us with the plates I asked for, and we hope that the merchant marines will also be able to obtain the quantity of plates to which it is entitled."—*N. Y. Times* 27/5.

MERCHANT SUBMARINE COMPANY.—Ten thousand ton cargo carrying submarines, are to be built by the Merchant Submarine Company, incorporated in Augusta, Me., with Simon Lake, submarine inventor, as president. The company is incorporated for $10,000,000.

Although three foreign governments are greatly interested in the company's scheme to overcome the effectiveness of Prussian submarines with greater submarines and two have placed orders for submersibles, the orders are not now being considered and the project has been submitted to the United States Government. The company has offered to begin to furnish cargo carrying submarines within five months provided the proper co-operation between manufacturing concerns where parts could be made and shipyards where they could be assembled is obtained. With that co-operation the officers say they could turn out 100 submarines, averaging from 5000 to 10,000 tons, in the first year and 500 in the second. —*N. Y. Herald*, 22/5.

EFFECTS OF SUBMARINE DUTY.—Assistant Surgeon Walter W. Cress, U. S. Navy, has compiled some interesting facts as a result of his observation of the personnel attached to submarines. He believes that long continuous duty on such craft is conductive to high blood pressure, adding: "Whether this is due to mental strain, loss of sleep, overeating with lack of exercise, excessive use of tobacco, coffee and tea, or some toxic agent peculiar to submarines, I am unable to say. It is noted that a slight fall occurred after the 48-hour surface run and the 3-hour dive. Undoubtedly this could be accounted for by fatigue or lack of all physical exercise during the preceding 48 hours." One effect, natural under the circumstances,

was that of loss of weight, and it is observed that there is probably no occupation, excepting that of a boilermaker, giving rise to as many cases of partial deafness as submarine duty. It is not uncommon for men to report to the medical officer that they have increasing difficulty in hearing the commands. This is attributed to the constant vibratory movement of the submarine, the straining of ears to hear above the noise of the engines, the presence of cold drafts of air down the hatches while operating on the surface and the excessive heat while running submerged, and the inhalation of gases given off by the batteries and fumes from oil tanks. However, it is believed that the number of bacteria and moulds present in the air of submarines while running awash and submerged is probably less than in dwellings and battleships. Dr. Cress expresses the conviction that it is "becoming more and more apparent that all men should undergo a thorough physical and mental examination before being assigned to submarine duty."—*Army and Navy Register*, 9/6.

LESSONS OF THE WAR

NETS.—That the nets for harbor protection put down by the U. S. Navy really do their work is shown by this item appearing in the *Boston Transcript* for May 12: "While coming into the harbor this morning, the ocean tug *Juniata*, with two barges in tow, fouled the submarine net at the entrance to the North Broad Sound channel, and held fast for 12 hours. She hit the net near the gateway, and then her propeller caught in the meshes. She was released by the mine planter *General Frank*."—*Army and Navy Journal*, 26/5.

MORE DESTROYERS NEEDED.—Two hundred American destroyers are needed in British waters to curb the submarine menace. The submarine situation is so serious that the truth is being kept from the public. More ships are being sunk monthly than can be replaced.

These declarations were contained in a letter sent by a United States naval officer now in British waters to Judge Townsend Scudder of Brooklyn. The letter was dated May 5 and the writer is a personal friend of the jurist. The judge gave the letter out for publication to-day, but withheld the name of the writer. The letter says:

"My dear Judge: I am taking the liberty of writing to you in order that knowing the truth you may be able to remedy the evil. A number of destroyers arrived in port yesterday after a 10 days' trip. This proves that the boats of this type can cross—it had never been attempted before.

"What I am writing to you about is this: The situation is really getting out of control. The American public has been fed on lies for so long that it will be doubly difficult to impress it with the facts. The simple facts of increasing danger and importance are:

"First: More ships are sunk per month than can possibly be replaced in the same interval of time.

"Second: An insignificant number of submarines is being destroyed.

"Third: Not one-tenth as many have been accounted for to date as we have been led to believe. A hundred American seagoing destroyers operating from this side may hold the situation in check long enough to enable the allied army to drive the Germans from France and Belgium. If the United States does not immediately embark on the construction of at least 100 or preferably 200 destroyers, then it will have only itself to blame for the handwriting on the wall.

"It is already too plain. I cannot write in detail. The letter would not get through. The situation is so serious that I am writing to you directly to tell you how things stand and to urge you not to believe the reassuring statements brought back by publishers and writers.

"I am where the submarine is operating most extensively, and for us the cards are now on the table. The American public must be scared

into a realization of the truth if its present isolation prevents temporarily the growth of the patriotic impulse."—*Washington Post*, 31/5.

WE HAVE NO SURE DEVICE TO END U-BOAT PERIL.—According to Professor Francis B. Crocker, who for 25 years was head of the Department of Electrical Engineering of Columbia University and is a Past President of the American Institute of Electrical Engineers, the submarine problem is not solved, and is not even near solution. Professor Crocker, who is now studying methods of curbing the U-boats, said that the American people had been lulled into a feeling of security about the menace and were in danger of belittling it.

"No certain method of destroying submarines has been invented," said Professor Crocker, "and there is none that is past the experimental stage as yet. Neither of the two American inventions, which have been said to be 'sure death' to submarines, has been perfected, and to my mind neither is at all sure to do the work hoped for. Furthermore, there is no device in Europe that can do it. I know this from submarine experts recently arrived here from the other side.

"This is not generally known. The American people are under the impression that American inventive genius has solved the submarine problem and have ceased to worry about it. We are making the fatal mistake of patting ourselves on the back because we are going to do something. This was shown by the reports of Professor Michael I. Pupin's address before the New York Academy of Sciences. These reports said that Professor Pupin saw the end of the submarine peril. Since then I have met a number of prominent men who have been congratulating themselves on the assumption that the end of the submarine activities was in sight. This is not so—far from it!

"Professor Pupin was misunderstood. He did not say that American inventive genius had solved the submarine problem. All he said was that we have the ability to solve the question and he based his assertion on our record of past achievements. All he did was to express a hope!

"The American people are anxious to hear of anything that will lessen the submarine menace and Professor Pupin's words were taken to mean that a solution of the peril had been found. This is not so. The people of this great peace-loving country are only too willing to listen to a lullaby—they do not like the strident call of alarm. They have been asleep for nearly three years and only stirred when it became necessary to declare war on Germany. They understood that the submarine was real then, but now that reports are being spread abroad that its master has been found, they are blissfully returning to their apathy.

"America must awake! All cannot enlist, all cannot farm, all cannot buy bonds, all cannot make munitions and airplanes, but all can and must wake to the peril now facing this country. Our people do not realize that they are at war, and they try not to do so. They have no conception of what this war means, and unless they wake to it the final cost will be terrible.

"If a perfect device had been found for destroying the U-boats it would be months before it was ready. War preparations are moving too slowly. They are being made with the slowness that characterizes peace. We must hasten; every hour gained is invaluable. While we are talking Germany is doing, and her submarines are continuing to destroy.

"England was slow to realize the vital import of the war—that it meant the extinction of the British Empire—but the English are awake now. We Americans are quicker to arouse than the English, but we are still resting assured that everything is all right, and that it is only a question of a short time before the end. This is absolutely criminal. We must realize that every delay avoided now means a proportionate shortening of the war, and we must hasten. We must wake up!

"Of course, I place every confidence in the scientific men of this country. In their line they are the leaders of the world, but all their inventions

will be worthless if they come too late; and they will be too late unless our people stand behind them and urge action.

"The first step in waking the United States is the realization of the truth, and that is that the submarines are as active and dangerous as ever. We must remember this morning, noon, and night, and must make every effort to evolve a method for destroying them. This will probably be done by greatly multiplying destructive agents. Destroyers, trawlers, aircraft, nets, and other existent contrivances must be increased tenfold or perhaps one hundredfold, and these must be helped out by the new inventions now being developed, before we can cope with the undersea boats."—*N. Y. Times*, 2/6.

VOLUNTARY CENSORSHIP.—In order to guide the newspapers of the United States in their voluntary censorship of war news, the committee on public information has issued a series of regulations on the subject, copies of which have been sent to every newspaper in the country. Virtually all of the matter specified by the committee as dangerous and liable to be of value to the enemy is of the character which most of the newspapers of their own accord scrupulously have eliminated from their columns.

In making public the regulations George Creel, chairman, announced that the committee was given its name in no spirit of subterfuge, and that its censorship function will be subordinated to the task of giving the people information.

"The one effort will be to open up the business of the government as far as may be proper and possible to the inspection of the people," he said. "Channels of information will be cleared of dead wood, permitting a freer and more continuous flow, and in every safe and prudent manner officials of government will be induced to give fullest recognition to the truth that public support is largely a matter of public understanding."

The committee was appointed by President Wilson. There is, however, no law vesting it with censorship powers.

Following are the regulations:

"In order to prevent the use of our press by the enemy, it is necessary to avoid publication of news items or articles which will interfere with our plans of campaign or render more easy the work of hostile spies. The suppression of all news matter obviously likely to be of direct utility to the enemy is urgently expected. Such matter is indicated specifically as follows:

"*A. General.*—1. News regarding naval and military operations in progress except that officially given out.

"2. News of the train or boat schedules of traveling official missions in transit through the United States. It is the duty of hospitality to surround distinguished foreigners with every protection.

"3. Threats or plots against the life of the President or other high officials unless announced from authoritative sources. In such times of tension unbalanced minds are especially susceptible to suggestion, and all accounts of such crimes and trials growing out of them are likely to influence weak minds and incite to criminal acts. When arrests are made this specific charge should be minimized by mere mention as 'disorderly conduct.'

"4. News relating to the activity of secret police. Their work in protecting the country from the enemy's agents in our midst is handicapped by publicity.

"5. News of possible or observed movements of alien labor through the territory of the United States or their arrival at or embarkation from any of our ports.

"*B. Naval.*—News relating to the naval operations, as follows:

"1. The locality, number, or identity of warships belonging to our own navy or to the navies of any country at war with Germany.

"2. Secret notices issued to mariners or other confidential instructions issued by the navy or the Department of Commerce relating to lights, light ships, buoys, or other guides to navigation.

"3. All information concerning the departure of merchant ships from our ports.

"4. All information indicating the port of arrival of incoming ships, or after their arrival indicating, or hinting at, the port at which the ship arrived. These rules apply with equal force to information indicating ports from which they sailed. It is suggested that arrivals of merchant vessels may be published under a general heading similar to the following: 'Arrivals of Vessels—At Atlantic ports: *Suffolk, Neptune.* At Pacific ports: *Mankato.*'

"5. Details as to convoys and as to the sighting of friendly or enemy ships whether naval or merchant.

"6. Information concerning the laying of mines or mine fields by our own authorities or by the authorities of any nation at war with Germany.

"7. Information regarding signals, orders, or wireless messages to or from war vessels.

"8. Information regarding operations by or against submarines. In respect to unverified reports of submarine victories or submarine disasters, the committee goes no further than to urge restraint and to request that the greatest care be taken to avoid confusion between mere rumor and official announcements.

"9. Information relating to dry docks and to all classes of work, repairs, alterations, or construction performed in connection therewith.

"*C. Military.*—1. News of possible or observed movements of Canadian troops through the territory of the United States or their arrival at or embarkation from any of our ports.

"2. Information regarding the fixed land defences of the United States, their very existence, as well as the number, nature, or position of their guns, should not be mentioned.

"3. Information in regard to the train or boat movements of troops is at all times and under all circumstances dangerous during a war and should be scrupulously avoided.

"4. Specific information regarding the duties of small detachments should be avoided as dangerous and laying them open to attack.

"5. Information regarding the assembling of military forces at seaports from which inference might be made of any intention to embark them for service abroad.

"6. Information regarding the aircraft and appurtenances used at government aviation schools and tried out in experimental tests under military authority."—*Army and Navy Register, 2/6.*

CABLE CENSORSHIP.—The office of the director of naval communications and chief cable censor has issued Cable Censorship Regulations, No. 2, effective May 31, superseding and amending No. 1, issued May 1.

The regulations follow:

"Language: Cablegrams to Central and South America, to the West Indies, and to points reached by the Pacific routes, may be written in plain English, French, or Spanish.

"Codes: The following authorized codes may be used, conditioned on their acceptability under the censorship regulations in effect in the foreign countries concerned. The name of the code shall be written in the check and will be signaled free:

"1. A, B, C, fifth.

"2. Scott's tenth edition.

"3. Western Union (not including five letter edition).

"4. Lieber's (not including five letter edition).

"5. Bentley's complete Phrase Code (not including the Oil and Mining Supplements).

"6. Broomhall's Imperial Combination Code.
"7. Broomhall's Imperial Combination Code, Rubber Edition.
"8. Meyer's Atlantic Cotton Code, thirty-ninth edition.
"9. Riverside Code, fifth edition.
"10. A, Z.

"Addresses must be complete; but properly registered code addresses may be used where permitted by the censorship abroad. However, code addresses registered subsequent to December 31, 1916, may not be used in messages to and from Central and South America, Cuba, Porto Rico, Virgin Islands, Haiti, San Domingo, Curaçao, or in messages transmitted over the Commercial Pacific cable or via trans-Pacific wireless.

"Cablegrams without text or with only single-word text will not be passed.

"Signatures: All cablegrams must be signed; in the case of individuals, by the surname at least; in the case of a firm or organization, by the surname of a responsible member of the firm or officer of the organization, when satisfactory information regarding him is on file with the censor. The full name of sender must appear on space provided on blank. Code addresses as signatures are not permitted.

"Suppression, delays, etc.: All cablegrams are accepted at senders' risks and may be stopped, delayed, or otherwise dealt with at the discretion of the censor and without notice to the senders. No information respecting the transmission, delivery, or other disposal of any cablegrams shall be given by paid service, and requests made by mail must be addressed to the origin by free service when a message does not conform to the censor-Telegraphic or post acknowledgments of the receipt (P. C. or P. C. P. services) are suspended to all countries.

"Information to senders: The cable company will notify the station of origin by free service when a messages does not conform to the censorship regulations. Any explanation of a test word or words, etc., required by the censor from the sender in the United States or Canada shall be obtained by a collect message from the censor to the sender and by a paid reply from the sender of the cablegram.

"Coded cablegrams filed directly at cable offices where a cable censor is stationed, as at New York, Key West, Galveston, and San Francisco, should be accompanied by a translation, and if it is certified by some responsible member of a firm it will tend to expedite the transmission of the message.

"Figures: Unrelated numbers or code words which translate into unrelated numbers prohibited.

"Serial numbers: The serial numbering of cablegrams will be permitted when the following conditions are complied with: Four figures will be used. The first two figures will be the daily serial number of the cablegram. The second two will be the day of the month. In the first nine messages of each day the first figure will be '0.' On the first nine days of the month the third figure will be '0.' The serial number will be the last word in the message and will immediately precede the signature.

"Test words: Test words are permitted when senders comply with regulations which will be furnished on application to the censor or telegraph and cable companies.

"To relieve individuals and organizations transmitting money by cable of the necessity for furnishing copies of their systems of test words, affidavits will be accepted to cover the use of such test words.

"Organizations and individuals desiring to use test words to authenticate their messages and to act as a check on the amount of money transmitted must furnish an affidavit to cover the following:

"'The test word will be the first word in the body of the message. Such test word will have no other meaning or use than that of authenticating the amount of money transmitted or that of preventing fraud by unauthorized payments of money.'

"The letter transmitting the affidavit should state the cable landing point or points through which the use of a test word is desired—that is, a bank sending messages from New York, Galveston, and San Francisco should so state in their letter transmitting the affidavit. If the bank handles cable business through one cable landing point only, such as New York cable origin, the letter of transmittal should state this point only.

"Affidavits should be mailed to the chief cable censor, Room 209 Southern Building, Washington, D. C.

"Prohibited: Military information, aid to the enemy, information of movements of all vessels to submarine zone, private codes, cablegrams not understandable to the censor.

"It is the constant study and effort of the cable censorship to ease the situation of the American trader and correspondent consistent with the objects of military censorship. Among the significant changes above from Regulations, No. 1, are:

"1. Instead of requiring the signature in full of a firm, corporation, or other organization the signature of the surname of a responsible member of the firm, corporation, or other organization is accepted when satisfactory information regarding him is on file with the censor.

"2. When translations and decoded copies of cablegrams are certified by some responsible member of a firm or organization they will be expedited in transmission.

"3. When the context in which figures appear is clear they will be allowed, but unrelated numbers, or code words which translate into unrelated numbers, are prohibited.

"4. The serial numbering of cablegrams will be permitted when the following conditions are complied with: Four figures will be used. The first two figures will be the daily serial number of the cablegram. The second two will be the day of the month. In the first nine messages of each day the first figure will be '0.' On the first nine days of the month the third figure will be '0.' The serial number will be the last word in the message and will immediately precede the signature.

"5. Test words are allowed when senders comply with the above regulations."—*Army and Navy Register*, 9/6.

WAR SECRECY.—In denying (June 9) various rumors that have been afloat recently regarding a disastrous naval engagement, Secretary Daniels took steps to prevent naval information reaching the enemy through unguarded talk by persons connected with the navy.

The Secretary issued an order forbidding any one in the naval service to disseminate military information, and cautioning all not to discuss any question relating to the disposition, movements, or the proposed movements of naval or military forces at any time, except officially, either among themselves or with any persons outside the naval service. The order makes it plain also that families and relatives of naval officers and of the men in the navy are considered as being "outside of the naval service." Under this rule a naval officer would not be allowed to discuss naval information with his wife, and officers and men would not be allowed to disclose military facts in letters to relatives or friends.

The loyalty of wives of officers and men, and of their relatives is not questioned, but there is ample ground for the statement that information given by officers to the feminine members of their families has been spread unintentionally at whist tables and in social gatherings and in feminine conversation, and that this has been carried by word of mouth to the point where it has become public property, and may have reached the ears of German agents. In fact, Mr. Daniel's order says specifically that such information has reached the enemy.

The Secretary's Order.—The order is as follows:

1. The department has reason to believe that information of a character most valuable to the enemy, and which might prove most disastrous to the

navy, has in some way reached the enemy. In view of the strenuous efforts that have been made to prevent the dissemination of such information, the department believes that in practically every instance this has resulted from certain information being given in confidence to, or spoken in the presence of, a close relative or a friend who, failing to appreciate the gravity of the offence, inadvertently transmitted it into the hands of those who most desired to obtain it.

2. The department has on previous occasions endeavored to impress upon every one in the naval service the urgent necessity for carefully guarding against the dissemination of any military information which could possibly be of advantage to an enemy. The situation at this time is entirely too grave to permit of a continuance of present practice in this regard. Officers, enlisted personnel, and civilian employes are therefore directed not to discuss any question relating to the disposition, movements, or proposed movements of naval or military forces (including personnel) at any time, except officially, either among themselves or with any persons outside the naval service. It should be clearly understood that families and relatives are to be considered as "outside the naval service."

3. All persons who attempt to obtain prohibited information from persons in the naval service should be regarded with suspicion and reported without delay to the proper authorities.

4. Those to whom a knowledge of a violation of this order comes shall consider it a serious official duty to report the matter immediately to the Navy Department for disciplinary action.

5. This order shall be read to the crews of all naval vessels and shall be posted in conspicuous places on board all ships of the navy. Chiefs of bureaus and commandants of navy yards and stations will see that it is brought to the attention of all persons, civil and military, under their orders.

Conspiracy of Rumors.—The formal announcement of the Navy Department follows:

"The country is being poisoned by rumors of battle and disaster that are absolutely without the slightest foundation in truth. Reports from the commandants of naval districts, telegrams from newspapers, and letters from individuals have forced me to the conclusion that there is an organized conspiracy on foot to alarm and distress the people of the United States.

"Among the most persistent of these false reports is one that declares that a naval engagement has taken place between the German fleet and the combined fleets of England and the United States, and that in this battle 60 English and American ships were sunk or disabled, two of the number being the *Pennsylvania* and the *Texas*. In elaboration of this falsehood there is the added rumor that the hospitals at the various Atlantic Coast naval yards are filled with crippled sailors and marines, and that the various hospitals of New York City are equally crowded with wounded men. By way of circumstantiality it is being rumored widely that a passenger arriving on one of the Holland-American Line steamers has stated that his vessel passed through the battle area after the engagement and that the sea was thick with floating bodies. All of these outrageous falsities are accompanied by the explanation that the Washington authorities are in a conspiracy with the press to keep the truth from the people.

"No such engagement has taken place. The American fleet has not yet been in action. No ship has been lost. There are no wounded sailors or marines in any hospital.

"The declared policy of the Navy Department is one of absolute openness. If disaster comes no effort will be made to minimize it. The people of the United States are asked to trust in this pledge and aid in stamping out this campaign of rumor that is so plainly the product of disloyalty."—*N. Y. Times*, 10/6.

THE GUN ACCIDENT ON THE "MONGOLIA."—It would be most unfortunate if the fatal accident on the *Mongolia* should have the effect of shaking the confidence of the public, to say nothing of our enlisted men, in the quality of the ammunition which is being served out to the gun crews on our ships. The men who serve the guns understand, of course, that the death of the two nurses, tragic and deplorable as it was, resulted from an accident of such an unusual and "freak" character, that the possibility of such an accident happening again is very remote.

The pieces of metal which caused the fatality were fragments of a brass cup which is used for closing and keeping air-and-moisture proof the powder charge. In the guns mounted on the *Mongolia* the shell and powder are not carried in one cartridge, but are loaded into the gun separately. The powder is contained in a brass cylinder of the same diameter as the powder chamber, into which it fits snugly. Its forward end is closed by a brass cup, which, when the gun is loaded, lies next to the base of the shell.

When the gun is fired, the powder gases exert a pressure of 18 to 20 tons on every square inch of the interior of the powder chamber; and hence the 6-inch plate is forced against the base of the shell with a total pressure of over 500 tons. Under the enormous frictional resistance and because of the rifling, the plate will rotate with the shell, and as it issues from the muzzle its periphery will be spinning at the speed of about 1500 feet per second.

Now mark the conditions. As soon as the flat face of the cup is clear of the muzzle and while the flange of the cup is still supported by the bore of the gun, a portion of the flange will be exposed to the full bursting pressure (say about 8 tons to the square inch), and will be ruptured, the whole cup breaking up into fragments. Since the cup is rotating at a speed, at its circumference, of 1500 feet per second, the fragments will tend to fly off at right angles to the trajectory of the shell; but because the fragments also have a forward velocity of 3000 feet per second, their line of flight would be, say, 30 degrees from the line of flight of the shell. This consideration will partly explain how the pieces of a cup that was fired from a gun trained only a little forward of the beam of the ship could have travelled at right angles to the line of flight and struck persons that were seated on an upper deck and 175 feet away from the gun.

The main contributory cause, however, was the lateral rush of the gases as they mushroomed on escaping from the muzzle of the gun. To understand this it must be remembered that immediately the base of the shell leaves the gun the velocity of the escaping gases is over 30,000 feet per second (maxim), and that these gases escape at this velocity not merely in the direction of the shell but laterally as well. It is quite conceivable that this lateral rush of the gases coupled with the centrifugal effect would suffice to carry the fragments with high velocity in a direction at right angles to the axis of the gun. The means adopted by the Bureau of Ordnance to prevent a repetition of any such accident is the very simple one of substituting a cap of wood or fibrous material for the metal cap hitherto used.

If it be true that several shells have burst in the guns on some of our ships, this is another and most serious matter calling for thorough investigation.—*Scientific American*, 9/6.

A PROGRESSIVE NAVAL POLICY ESSENTIAL.—How naval efficiency is handicapped under our form of government was discussed by a naval officer in the *Evening Mail* recently, who stated that the naval experts in America are subordinate to laymen, who are frequently better politicians than anything else, and who, because of their official rank, decide important technical and strategic questions on which they have but a negligible knowledge. Not only that, their usefulness in a government constituted as ours is, is further handicapped by the brevity of their tenure of office.

In other words, these officials, as a rule, have partially mastered the elements of efficiency in naval power, when, by a change of administration, they are displaced by others equally as incompetent to grapple with this problem, who, in turn, when they have in part grasped the needs of the service, are succeeded by others. And so it goes. There are also administrations where changes of Cabinet heads are frequent.

These defects are, however, intimately woven into democratic institutions, and the obstacles to naval efficiency are a part of the political fabric of the country. Other deficiencies, however, that this writer cites could be obviated by the adoption of standardized production and by placing motives of patriotism above motives of profit. The accomplishment of these objects would reduce the dividends of some industrial companies, but would increase the fighting strength of the country. While much can be said against the executive form of government it has certain advantages. For example, the construction of the Panama Canal is perhaps the most convincing. The longest step toward similar achievement so far as the navy goes is perhaps the creation of the Naval Board, as this carries with it the potentiality for engaging experts for national purposes. What we need, in fact, is a naval policy that is progressive and that will not neglect even the smallest detail in giving us the most efficient navy possible, not only in vessels, but confidence of its personnel in the equipment placed at the latter's disposal.

These points are not reproduced here in a spirit of faultfinding, but as an inspiration for better and greater things for the service that must always be our first line of defence against a foreign foe. That there is room for improvement is shown by the fact that in the 15 years just previous to the European war we spent $500,000,000 more on our navy than Germany did on hers, and during the latter years in that decade and a half we fell to third rank as a naval power, while Germany took our place as the second naval power of the world.—*Marine Journal*, 2/6.

BUSINESSMEN WARN U. S. OF DANGER.—Realizing that the country is fast approaching a condition when any day may see actual warfare carried to its own shores, the Chamber of Commerce of the United States, representing all the chambers of commerce in America, has passed a resolution asking President Wilson to name a special commission to give the people the truth and arouse them to a sense of their duty.

The situation is considered to be so acute that the executive committee of the chamber did not wait for approval of the resolution by its members through the usual channels of the mails, but requested immediate approval by telegraph. This was granted, the contents of the resolution, which was passed on May 24 were made public.

It is understood that the President will comply with the request, naming a commission entirely independent of the committee on public information, of which George Creel is chairman. The National Security League, it was also announced, will send 2000 speakers through the country to give the people the truth.

What is the truth? Here it is, as officially announced by the Chamber of Commerce under the signature of its chairman, Joseph H. Defrees, of Chicago:

"*Some Possible Contingencies.*—Aside from the question of shortening the war there are life-and-death reasons why the United States should speed preparations for the great conflict. There are possible and even probable contingencies, which might cause the United States to bear the brunt of the fighting on her own shores. These are:

"If Russia should collapse.

"If the British fleet should be overcome.

"If the food situation should bring our allies to their knees.

"If great reversals should be met on the western front.

"If the submarine menace be not checked."

That any one or all of these contingencies, far from being the wild imaginings of alarmists, is likely to happen at any time, the association, representing the same judgment of business men actually in touch with conditions, points out:

"The impossible has happened so often in this war that any one of these contingencies is not impossible; the Germans should have gotten through at the Marne, and captured Paris and Calais, and established control of the channel; the English fleet should have annihilated the German fleet at Jutland; the central powers should have been starved before the last harvest."

Turning to the question of the submarine, the association again finds it necessary to emphasize the fact that we may have the scene of great battles transferred to our own shores.

"The submarine campaign has resulted in the destruction of 1,500,000 tons of shipping during the months of February, March and April. Coincident with this enormous decrease of the world's ocean-going mercantile marine have come increased demands upon shipping and the two combine to make this one of the most important and most threatening aspects of the war situation to-day.

"The world-wide food shortage is making itself felt hardest upon Germany, next upon certain entente countries and lastly upon the neutral countries, especially Scandinavia and Spain. The effect of this shortage may soon be felt here.

"This, then, makes it highly important that the United States quickly mobilize its entire forces in order to bring about a decision before the brunt of the fight will be shifted to America."

The crux of this whole situation, according to an authoritative source which was in close touch with the British mission, lies in our ability, not only to replace tonnage destroyed, but to increase it to meet the constantly increasing demands.

As an example, Daniel Willard, director of transportation of the Council of National Defence, told the governors' conference that in order to win this war, America would have to rebuild the railroads of France and possibly of Russia also.

France Short of Men.—France, Mr. Willard told the governors, has not the necessary labor to keep her automobiles and aeroplanes in repair. In addition to transporting these 500,000 workingmen and another 500,000 fighting men to France, the United States must find a way to transport their food and supplies, not to mention the raw materials needed to reconstruct the railroads.

It has cost England as much to feed her 5,000,000 men in war time as would ordinarily have kept 40,000,000. That will give some idea of the gigantic task before this country, the Chamber of Commerce points out.

The same authority points out that in order to meet the problem it must first be realized. The list of required tonnage must be checked every week to meet the new demands that must arise every week and every day. If only the lost tonnage, which it is conservatively estimated will amount to 7,000,000 tons in a year is reckoned as a base, disaster may come at any time.

There are 900,000 tons of German ships that will be available for this country and its allies at the end of the year. In addition, Great Britain will have 2,000,000 tons, double its capacity of last year, and this country will have 1,000,000 tons. That will leave 10,000,000 tons, a very liberal estimate, which is 4,000,000 tons less than last year, in the Atlantic lanes to carry all of our increased production.

There must be careful checking each day of all new demands for shipping space so that luxuries can be eliminated and the space, otherwise taken, allotted to actual necessaries and speeding up of the wooden fleet, which must show more progress than has been indicated to date.

The Chamber of Commerce circular says that the main obstruction of speed is the failure of the people to "appreciate the fact that we are at war." It is felt that an urgent need exists for precisely the same kind of campaign of national education and information as that conducted by England when it came to the realization of what war really meant.

Cites Seven Urgent Matters.—Seven urgent matters, in the opinion of the Chamber of Commerce, must be made clear to the people:

That the banks cannot take care of the bonds. The bonds must be bought by individuals.

That conscription does not carry with it anything of disgrace. It is as patriotic and much more effective than the medieval system of volunteering.

That labor must be readjusted on a large scale. It must be made more productive and its varied problems carefully considered.

The food administration will necessarily be repressive, but is in the interest of all

That there is a false and a proper national economy. Business in war time is not "as usual."

That the intelligent co-operation of women in both direct and indirect branches of war effort is absolutely essential.

That there should be a centralized control for the systematic support of the families of those who go to war.

This should be through the intelligent co-operation of the government, local organizations and employers.

Warns of Coming Crisis.—The circular concludes with the warning that "present conditions indicate clearly a great crisis is approaching in the war situation, and that it is probable the united efforts of America on a prodigious scale must be called for in the very near future.

The campaign (of education) should be considered as absolutely apart from routine press publicity matter and the ordinary output from various departments of the government meant for publication in newspapers and periodicals.

"A systematic campaign of education should be projected by the national government, which would clear away all doubts from the minds of the people as to what threatens them, as to what obligations rest upon them now and henceforth every day until the war is won."—*Washington Post.*

NAMES OF ARMED MERCHANTMEN ENGAGING SUBMARINES NOT TO BE PUBLISHED.—A request to newspapers not to publish the names of armed merchant vessels which encounter submarines was issued June 14 by the Committee on Public Information.

"A prime concern of the voluntary censorship imposed upon itself by the press," said a committee statement, "has been the suppression of the identity of armed merchant vessels that may engage in defence encounters with submarines. The captains of these vessels not being a part of the recognized naval organization of the United States are outside the protection of laws of war, as the German Empire interprets them. In event of their capture death would be their fate. The judicial murder of Captain Fryatt makes clear the German attitude toward these men.

"The peril of the destruction of the vessels themselves in subsequent voyages also is intensified by establishing the identity as the destroyer of a submarine. The added danger to the picked gun crews of fine young Americans is equally apparent.

"The agreement of secrecy was shattered last week by cable dispatches from France naming the *Silver Shell* as the victor in a submarine combat. The act was unintentional, and the government of the United States has since been assured that both the French and British governments will co-operate in the future for the protection of our merchant ships and their captains.

"In the case of the encounter of another merchantman with a submarine, recorded June 13, the voluntary agreement was broken, a few

New York evening newspapers printing the name of the ship and the name of the captain. In spite of this all but three of the morning newspapers of New York City kept the faith, though aware that in this particular instance the damage of publicity was done. The effort was to prevent error from establishing a precedent.

"The agreement must be restored. In no other way can there be lessening of the danger of future attacks upon the ships that fire on submarines, or their captains saved from ignoble death in event of capture. It is a Fryatt horror that is being guarded against.

"The Navy Department of the United States makes formal request upon the press for restoration of the agreement to its original force. No matter from which side of the ocean comes the news, it is asked that names and identities of captains and ships damaging or sinking submarines be withheld from publication."—*N. Y. Herald*, 15/6.

MISCELLANEOUS

DANGER OF COLLISION DUE TO EFFECTS OF WAKE-STREAM AND SUCTION.—The following article by C. H. Holst appeared in *Engineering*, May 18:

"In addition to what has been assumed in a previous article[1] as being the direction of the flow of water at the stern of a ship some further considerations may here follow, which are in aid of the original assumption. Those who have gained experience in connection with steamers or power-boats navigating on shallow and narrow waterways, so frequently met with in Holland, are quite familiar with the phenomenon of 'suction,' a phenomenon which is seldom experienced when navigating on the open sea.

"Masters of canal boats know fully well that when their vessel represents a comparatively large area of midship section as compared with the section of the canal, they have to be very careful to keep the head of their ship in the middle line of the waterway, and that when overtaking another vessel they both do best to slacken their speed, so as to avoid very grave risk of collision or grounding. They also know that when meeting another vessel this risk, although present, exists in a lesser degree.

"Boards or canal companies prescribe strict regulations as to certain speeds not being surpassed, so as to protect themselves against damages occurring to the banks of their property, and, generally speaking, inland navigation of the proper school for studying the dreaded symptoms of suction, wash, or how else these inconveniences may be called, which are rarely encountered by sailors.

"The views set forth by different people connected with inland navigation differ widely as to the probable cause of this well-recognized nuisance. Some attribute it to the action of the bow-wave, others to the action of the propellers, others to the irregularity of the canal banks, or to the irregular depth, but, curiously enough, little attention is generally given to the influence of the wake-stream, which, in the author's opinion, is the true and only cause of it.

"When studying the phenomenon on board the vessel, it will be found that in front of the ship, if the bow be pretty bluff, a rising of the water-level is to be observed—the finer the bow the shorter the distance in front will be—whereas the water-level shows distinct symptoms of depression near the after-body.

"This rising of the water-level is clearly demonstrated as occurring over a pretty wide distance in passing small rowing boats moored to the banks. These appear to be lifted bodily, but without any violent pulling on their moorings. Gradually, as the ship passes the moored boat, it sinks down again, but to a greater depth than the original water-level, which

[1] See article "On the Difference in Effect of Twin Screws when turning 'Inwards' or 'Outwards,'" published in *Engineering*, May 4.

condition is clearly visible if the boat be moored to a small landing platform on the boards of which the regular watermark is indicated by the growth of water plants, and so on.

"This sinking sets in as soon as the midship section of the steamer has passed the moored boat, and gradually increases; it is combined with a violent pulling at the moorings and a backward movement as well as by a movement towards the steamer. Once the steamer has passed, the little boat rises again with the water-level and comes back to its original position. This series of effects is illustrated in Fig. 1.

"Also when passing parts where the banks are gently sloping into the water and covered with reeds, as is often the case in Dutch canals, the stems of the reeds may be seen being pushed gently towards the bank and the water rising between them, up to about the midship length; and, again abaft the midship section, the water rushes out and the stems incline towards the canal, and floating impurities are swept out from between the reeds and remain in view, until pretty nearly behind the ship everything is restored to peace and to its original place.

Fig. 1. STEAMER PASSING A MOORED BOAT.

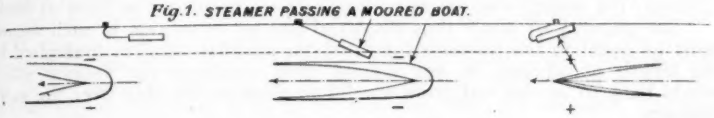


Fig. 2. STEAMER RUNNING INTO BANK.

Fig. 3. STEAMER OVERTAKING ANOTHER.

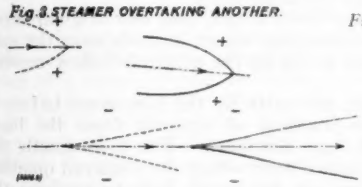
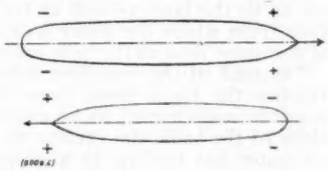


Fig. 4.—TWO STEAMERS MEETING.



"Another symptom, but worthy to be noted, is offered by the foam created at the bow of the steamer. On long stretches of perfectly smooth water you may follow the lines of foam and bubbles, forming two exactly parallel lines at a mutual distance of some meters in excess of the width of your steamer, not unlike the wake left behind after the passage of a paddle steamer.

"Only in the case of short and bluff boats, principally when bluff at the stern, will it be observed that the lines of foam approach each other near the stern; yet very rarely are they found joining into one compact mass unless the propellers of such ships are 'churning' the water into an additional width of foam behind the ship.

"One more evidence in favor of these views may be furnished by the common practice of ferrymen putting passengers on board of passing steamers at small riverside stations where no regular stops are made. These men row out in small boats up to the middle of the river and await the approaching steamer, keeping their boat head to the tide, but in as near a line as possible with the stem of the steamship. When quite near, the bow-wave pushes the rowing boat gently aside, oars are laid in, and

the ferryman, taking hold of a rope thrown from the steamer's deck, brings his boat and passengers safely alongside, often just behind the paddle boxes. The passengers being helped on board, the rowing boat sheers off from the bigger vessel and is almost directly out of danger to be taken by the wake-stream, as at a couple of feet only from the steamer's side the ferryman takes up the oars again and pulls back towards the shore, whereas the steamer puts on 'full speed' again as soon as the towing rope is let go.

"Do not these simple facts teach us some valuable lessons as to the movement of the water in the vicinity of a moving ship?—Lessons which may be summarized as follows: The bow of each vessel drives a quantity of water before it, in a direction normal to the curvature of the water-lines of the fore body. The water thus set in motion is at once retarded by setting in motion other particles of water by mere contact with those originally touching the ship. This retardation extends over a certain distance from the ship, dependent on the original velocity of the disturbed particles, *i. e.*, on the speed of the ship. The water being retarded, the ship at its uniform speed overtakes the retarded water and so apparently 'cleaves' the water, whereas in reality it drives the water in front of itself.

"The quantity of water thus displaced and set in motion in each second must be equal to the immersed area of the midship section, multiplied by the length of advance in one second, thus equalling the volume which would have to be dug out from a solid to displace the ship over the same distance.

"At the same time as the midship section is moved over a certain distance ahead there remains an equal volume of water to fill up the space which would be left open at the stern when moving the ship in a solid matter. This volume of water cannot be composed of the same particles as those that were driven in front of the bow. Other particles which were at rest near the stern rush in from the sides and in a direction ascertaining the shortest possible way towards their destination, *i. e.*, in lines normal to the curvature of the water-lines of the after-body.

"The ship leaves this moving water behind her, and the original wave set up by the bow, as well as the surrounding water, spreads over the surface from which the water was taken to fill up the original hollow created at the same time as the bow-wave.

"Instead of the retarding influence met with by the bow-wave before it reaches the canal bank, there is an increase of velocity from the bank towards mid-channel to be expected near the stern. The more gentle the slope of the bank, the greater the distance over which the required quantity of water has to flow in a given time, as the depth fails to produce the necessary quantity within a short distance.

"Where sufficient depth is available the whole process of retarding the motion at the bow and of filling up the hollow at the stern is effected in a period of time so short, and extending over so small a distance from the ship, that the foam created at the bow is at rest and not subject to any transverse movement when passed by the stern, hence the two lines of foam show no tendency to approach each other.

"In a short vessel with bluff after-body the 'filling-in' cannot begin until the full stern has nearly completely passed. At the generally slow speeds of such vessels the distance to which the foam is thrown away from the bow is only insignificant, hence in these cases parts of that foam-covered surface flow towards each other from each side of the ship.

"In this way it may be explained that canal banks may be considerably damaged by the wake of a steamer passing near-by at a comparatively great speed. The 'rushing in' of the water 'gnaws' at the banks; the bow-wave can only cause a deposit of floating impurities to 'touch' them.

"It now remains to be considered how the steering is affected by the motion of the water, and how, when touching the bank, it is always the bow that comes into contact with it and not the stern.

"As a matter of fact, no master of a canal boat will steer his ship into the bank unless this should be necessary to avoid a greater danger, so generally it will be only necessary to consider what is likely to happen when a ship, steering a course *parallel* to the bank, is getting too near the one side of the channel.

"The bow-wave will be travelling on as usual; the retarding effect of other particles of water can only be assisted by the influence of the shallower depth, but this extra retardation does not interfere with the direction of the ship. But inasmuch as the cross-sections of the after-body require a continually increasing velocity of the water flowing towards it to fill up spaces which continually increase in volume up to a certain maximum, there will be a stronger influence of current nearer to the stern than immediately abaft the midship section.

"This current, coming in from the sideways, remains normally fed from the side of mid-channel, but the nearer the vessel may be to one of the banks, the greater the want of water on that side will be, and thus the required volume of water begins to flow in partly in a direction from aft, as indicated in the diagram, Fig. 2, annexed. The perfect balance between the two opposed currents, one acting on each side of the after-body, is then no longer maintained, whereas this balance remains maintained at the bow, consequently the stern is turned more towards mid-channel, causing the bow to run into the bank. The rudder affords no help in this event; on the contrary, its tendency is to do the reverse. Say, for instance, that the vessel is dangerously near to the starboard bank, then the rudder will have to get starboard helm to make the vessel sheer off, but as this means that the rudder itself is turned to port, it offers a greater surface to the current rushing in on the starboard quarter, and thus assists in driving the stern in the wrong direction.

"In the case of one vessel overtaking another the same causes will have the same effect unless the distance between the two be sufficiently great to keep each clear from the other's influence, or unless the speed of the overtaken vessel be very much reduced.

"Let us suppose, again, that the overtaken ship be on the starboard bow of the overtaking vessel. As soon as the starboard bow-wave of the overtaking ship comes within the influence of the flow of water closing in on the port side of the foremost vessel the resistance against the two sides of the bow becomes unequal, as the port bow of the aftermost vessel continues to meet the original resistance, whereas at the starboard bow this resistance is diminished by the motion of the water flowing towards the stern of the foremost ship, thus creating a suctional influence on the bow-wave and drawing the bow out of its safe course (see Fig. 3). Dependent upon the lengths of the two vessels, but supposing the overtaking one to be the shorter, there will necessarily be a moment when the filling up of both stern hollows can only be fed from astern, and the combined influence of the lesser pressure on the starboard bow and the extra pressure at the starboard stern will drive the overtaking ship helplessly into collision with the foremost. If the foremost ship be the shorter of the two the same danger will only be encountered somewhat later, the stern hollow of the longer ship then drawing the bow of the shorter towards her by diminishing the bow resistance on one side only.

"Bearing in mind the volumes of water which play their part in this condition, accidents are easily explained. In the case of the *Olympic-Hawke* disaster, for instance, there will have been a quantity of between 1500 and 1600 tons of water flowing in one second towards the *Olympic*, a quantity sufficient to diminish very seriously the pressure on the corresponding side of the *Hawke's* bow, whereas on the opposite bow there remained the pressure due to the setting in motion of perhaps some 1000 to 1200 tons per second. No wonder that the consequences of this state of things were disastrous to both vessels.

"And may not the cause of the lamentable *Titanic* disaster be explained as well by the same reasoning? Supposing this vessel to have been steaming in a direction parallel to the iceberg which tore up its side to such an enormous extent, the phenomenon described as of common occurrence in inland navigation must then have repeated itself, 'a want of water between the ship and the floating mass of ice,' and the splendid powerful ship was driven towards its inevitable doom.

"When two vessels are meeting each other in a parallel direction the circumstances are quite different again. As indicated in Fig. 4 the two bow-waves meeting in opposite direction have a tendency at first to drive the two vessels from each other, and there remains only the danger of touching each other sideways in a far less serious way than in the case just considered.

This latter risk is explained when it is considered that in passing each other there will be acting on each ship an unbalanced lateral pressure working from outside at the moment when the bow-wave of the one ship will encounter the stern hollow of the other at the adjoining of each. The different conditions here considered will be clearly illustrated by referring to the diagrams on page 1575."—*Engineering*, 18/5.

POTASH INDUSTRY.—Germany may emerge from this war with her former monopoly of the world's supply of potash to be counted among the things she has lost. The United States Department of Agriculture will have something definite to say on that point before the end of the summer, and after the completion of thoroughgoing experiments about to be undertaken with the seaweed or kelp on the Pacific Coast. That there are millions of tons of this kelp always available within the country's three-mile limit is known, as a matter of course; that this kelp, when dried, contains from 25 to 30 per cent potassium chloride is also known because of the chemical analysis of many samples. The thing that is yet to be learned by the experiments of this summer is whether the kelp can be harvested and the potash extracted at a cost that will make the operation profitable.

Frederick W. Brown, Chief of the Division of Fertilizer Resources of the department's Bureau of Soils, who is in charge of the experiment, is confident that the operation can be made to pay by utilizing to the full the by-products of the kelp. If he is right, one of the chief difficulties of the American farmer will be done away with. What that difficulty has grown into because of the war is indicated by the statistics of imports and prices before and since the war began.

For the year 1913 the farmers of America imported from Germany about 1,000,000 tons of potash for fertilizing purposes and paid $40 a ton. Since the growing season of 1914 the supply has been practically cut off and the price, for what little there has been, has risen to $450 a ton.

Already three private commercial concerns are gathering this kelp from the Pacific and treating it commercially. The Hercules Powder Company is taking it for the acetone it contains and the Diamond Match Company and the Swift Fertilizer Company are gathering it for the potash.

The government's experimental plant, now in course of construction, is in Summerland, Santa Barbara County, Cal. Congress has appropriated $175,000 for the work. This figure includes the cost of a curious craft, already built, which might be described as a huge seagoing mowing machine. It is equipped at the bow end with great reciprocating knives that work on the principle of the blades of the mowing machine and cut the kelp plants from 3 to 6 feet below the surface of the water. The several streamers of kelp are then taken up into the boat on a conveyor belt, at the top of which they are cut by other knives into 6-inch pieces and then dropped into the hold of the vessel. The boat in use will contain 100 tons of wet kelp, thus harvested and recut, and she can make two trips a day when operating on a kelp field near shore.

The weed is found growing in water to a depth of 100 feet. It is rooted on the bottom, grows to the surface, and then extends for hundreds of feet on the surface. The supply is inexhaustible, for it grows quickly after cutting, and can be cut four times a year like an alfalfa crop. A curious thing about the seaweed of the Pacific Coast is that it can collect so much potash from sea water which contains so little itself that it can hardly be detected by chemical analysis. The point is that the kelp catches the potash from so much water, so the stronger the tideway in which it is found, or, in other words, the greater the volume of water that flows by it, the richer it is in potash.

The 200-tons haul of wet kelp a day dries our to 20 tons when all the water is out, and this 20 tons of dried kelp will yield five tons of potassium chloride, not a drop in the bucket, as compared with the agricultural needs of the country, but if one boat can do that, and its daily harvest can be profitably treated, there is surely hope for the future.

In the meantime farmers on the Atlantic Coast are advised by the department to continue the ancient custom of many generations of farmers conveniently near the east shore of the country of getting the kelp and other seaweeds that come ashore and spreading them on the land. These smaller weeds of the Atlantic contain potash, too, that is quickly available to the soil as a fertilizer, but not in sufficient quantities to justify any such experiment as is to be tried on the Pacific Coast.

However, attempts are to be made to transplant the Pacific Ocean kelp in the Atlantic in the hope that it will establish itself there and give the more impoverished soils of the East the new wealth of fertilizer that they need so much more than the lands in the West. This scheme is based on the fact that the dried kelp, without further chemical treatment for the extraction of the potash, will serve the land as well as the extract. But so much of the kelp in this form is valueless that it would not pay to transport the bulk across the country.

"The process which seems most likely to succeed in commercial practice," said Mr. Brown the other day, "is to distill the dried kelp in retorts constructed on the principle of the by-product coke oven. This results in a charred residue containing all the potash salts, which may be recovered by leaching and evaporation. In the process of distillation the nitrogen in the kelp is driven off and recovered in the form of ammonia; combustible gas is evolved in considerable quantities and is available for use as fuel in the retorts and under the evaporating vats, and charcoal and tarry products are also recovered, which may be used or sold as fuel. Iodine is another of the by-products which may be recovered from the process and make this means of getting the potash for fertilizer an entirely economical undertaking."

Needless to say this plan of the government has nothing to do with the dreams of cruising the Sargasso Sea for potash-yielding kelp, for the experts have all decided that there is no such thing as the Sargasso Sea.—*N. Y. Times*, 3/6.

TEXTILE EXPERT FOR NAVY.—Herbert H. Lehman, of the banking firm of Lehman Brothers, New York City, has been appointed textile expert for the Navy Department. He went to Washington on May 20. Before he became a banker, Mr. Lehman was in the textile manufacturing business. He is a graduate of Williams College.—*Army and Navy Journal*, 26/5.

INVESTIGATION OF NAVAL AFFAIRS.—These are days of complaint, productive of quarrels, and with promise of numerous investigations on the part of Congress. Already three resolutions have been introduced in the Senate, one calling for information in regard to the fatality on board the *Mongolia*, already sufficiently answered by the naval Bureau of Ordnance; another relating to conditions somewhat peevishly described as prevailing on board the hospital ship *Solace;* and a third, demanded by Mr. Mc-

Cumber, which would reveal to the world the secret plans of anti-submarine warfare. The last-mentioned affair was based on a letter which is alleged to have come from a naval officer in European waters, whose identity may be located by the announcement in the Senate that the writer is a relative of the judge of the New York supreme court, to whom the letter was sent and by whom it was given out for publication. Without such opportunity to ascertain the authorship, naval officers would be inclined to believe that it did not come from a member of the commissioned personnel. There are indications that another investigation is in contemplation, one having to do with the negotiations instituted by the Navy Department for the acquisition of seagoing yachts for immediate war duty. It appears that the Assistant Secretary of the Navy some weeks ago organized a special board for patrol vessels (composed of Commander C. S. Freeman, U. S. Navy; Mr. A. T. Homer, and a reserve officer named Moran, who is a "tugboat man"), the duty of the board being to secure suitable boats with all possible dispatch. It is alleged that this board has designated the International Mercantile Marine Company of New York City as its official agent, the intention being to relieve the navy yards and the department of the routine labor of arranging for the acquisition of this craft. The company is also supervising all the alterations and the equipment necessary to be made. In the meantime, the Navy Department has asked for authority to requisition boats for war service. Members of Congress have expressed a desire to know upon what authority these negotiations have been undertaken. It will probably be one of the occasions for congressional investigation.—*Army and Navy Register, 2/6.*

CROCKER LAND EXPEDITION.—Donald B. MacMillan, the explorer, and the other members of the Crocker Land expedition, who went into the Arctic in 1913 and had been marooned in Greenland for two years, are safe. A cable message was received at the American Museum of Natural History from the Thorshaven, in Faroe Islands, off the coast of Scotland, signed by Dr. Harrison J. Hunt, physician of the expedition, announcing the arrival of the MacMillan party at Etah, as well as the members of the first relief party, who lost their ship.

George H. Sherwood of the American Museum of Natural History and Acting Chairman of the committee in charge of the Crocker Land expedition gave out the following statement:

"The steamer *Danmark* is the second ship chartered by the committee, which is composed of representatives of the American Museum of Natural History, the American Geographical Society, and the University of Illinois, for the relief of members of the expedition. The *Danmark* was chartered last year and sent north. The last previous word we had from the expedition was dated July 10, 1916.

"In the absence of news of the expedition it was thought advisable to charter the *Neptune*, and arrange to dispatch her to the relief of the party on July 10. She is commanded by Captain Robert Bartlett of Peary expedition fame. Plans for her sailing will proceed unless we get definite word from Dr. Hunt in the meantime that it will not be necessary. Three members of the orginal expedition came out of the north last year and returned to this country. They were Dr. Maurice Tanguary, Jerome Allen and Lieutenant Fitzhugh Green, U. S. N. They also sledged down over the ice packs in order to get back to civilization."

The MacMillan expedition started out in July of 1913 to find Crocker Land, which Rear Admiral Peary reported he had seen on his north pole discovery exploration. The expedition got into trouble soon after its start, when its ship, the *Diana*, was wrecked off Barge Point, Labrador. The party and its supplies were transferred to the schooner *Erik*, and reached Etah in the fall of 1913.

In 1915 the first relief expedition aboard the *Cluett*, and in charge of Dr. Hovey, was sent to rescue the party. The *Cluett* reached Etah, took several members of the party on board, and started away, only to be caught in the ice packs and held. Last spring the *Danmark* was chartered in Greenland and sent north to get the party. The last heard of her before May 29 was on August 20 of last year, when she was caught in the ice at Melville Bay. The *Cluett*, in the meanwhile, was released from the ice, and reached New Foundland last September. Comer, Dr. Hovey, and Ekblaw had gone back to Etah from the *Cluett*, and May 29 was the first word from them since last year. The MacMillan party had spent the winter on board the *Cluett*, ice marooned in Parker Snow Bay.

In November of 1914 MacMillan reported a journey of 1500 miles overland searching for Crocker Land. All he could find was a mirage of a large land of hills and valleys and mountains. He gave it as his opinion that this was what Peary saw in 1908 and reported as a new land. In his description then of what he saw he wrote:

"Stretching for at least 120 degrees there was every appearance of an immense land—hills, valleys, snow-capped peaks—as plain as a thing could possibly be. I even asked one of the Eskimos toward what point we should head. He smiled and said he thought it was 'poojok' (mist). Green declared that if he ever saw land, that was land. The only reason I had for doubting its existence was its size.

"As we proceeded, it gradually changed in appearance and extent with the revolving of the sun, and finally disappeared altogether. Standing later on the heights of the cape where Peary stood eight years before, we saw the same thing, and had we not been out there we could have taken our oath that it was land."—*N. Y. Times*, 30/5.

ESPIONAGE ACT

TITLE I

Espionage

Section 1. That (a) whoever, for the purpose of obtaining information respecting the national defence with intent or reason to believe that the information to be obtained is to be used to the injury of the United States, or to the advantage of any foreign nation, goes upon, enters, flies over, or otherwise obtains information concerning any vessel, aircraft, work of defence, navy yard, naval station, submarine base, coaling station, fort, battery, torpedo station dockyard, canal, railroad, arsenal, camp, factory, mine, telegraph, telephone, wireless, or signal station, building office, or other place connected with the national defence, owned or constructed, or in progress of construction by the United States or under the control of the United States, or of any of its officers or agents, or within the exclusive jurisdiction of the United States, or any place in which any vessel, aircraft, arms, munitions, or other materials or instruments for use in time of war are being made, prepared, repaired, or stored, under any contract or agreement with the United States, or with any person on behalf of the United States, or otherwise on behalf of the United States, or any prohibited place within the meaning of section 6 of this title; or (b) whoever for the purpose aforesaid, and with like intent or reason to believe, copies, takes, makes, or obtains, or attempts, or induces or aids another to copy, take, make, or obtain, any sketch, photograph, photographic negative, blue print, plan, map, model, instrument, appliance, document, writing or note of anything connected with the national defence; or (c) whoever for the purpose aforesaid, receives or obtains or agrees or attempts or induces or aids another to receive or obtain from any person, or from any source whatever, any document, writing, code, book, signal book, sketch, photograph, photographic negative, blue print, plan, map, model, instrument,

appliance, or note, of anything connected with the national defence, knowing or having reason to believe, at the time he receives or obtains, or agrees or attempts or induces or aids another to receive or obtain it, that it has been or will be obtained, taken, made or disposed of by any person contrary to the provisions of this title; or (d) whoever, lawfully or unlawfully having possession of, access to, control over, or being intrusted with any document, writing, code book, signal book, sketch, photograph, photographic negative, blue print, plan, map, model, instrument, appliance, or note relating to the national defence, willfully communicates or transmits or attempts to communicate or transmit the same to any person not entitled to receive it, or willfully retains the same and fails to deliver it on demand to the officer or employe of the United States entitled to receive it; or (e) whoever, being intrusted with or having lawful possession or control of any document, writing, code book, signal book, sketch, photograph, photographic negative, blue print, plan, map, model, note, or information, relating to the national defence, through gross negligence permits the same to be removed from its proper place of custody or delivered to any one in violation of his trust, or to be lost, stolen, abstracted, or destroyed, shall be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both.

Sec. 2. (a) Whoever, with intent or reason to believe that it is to be used to the injury of the United States or to the advantage of a foreign nation, communicates, delivers, or transmits, or attempts to, or aids or induces another to, communicate, deliver, or transmit, to any foreign government, or to any faction or party or military or naval force within a foreign country, whether recognized or unrecognized by the United States, or to any representative, officer, agent, employe, subject, or citizen thereof, either directly or indirectly, any document, writing, code book, signal book, sketch, photograph, photographic negative, blue print, plan, map, model, note, instrument, appliance, or information relating to the national defence, shall be punished by imprisonment for not more than 20 years: *Provided*, That whoever shall violate the provisions of subsection (a) of this section in time of war shall be punished by death or by imprisonment for not more than 30 years; and (b) whoever, in time of war, with intent that the same shall be communicated to the enemy, shall collect, record, publish, or communicate, or attempt to elicit any information with respect to the movement, numbers, description, condition, or disposition of any of the armed forces, ships, aircraft, or war materials of the United States, or with respect to the plans or conduct, or supposed plans or conduct of any naval or military operations, or with respect to any works or measures undertaken for or connected with, or intended for the fortification or defence of any place, or any other information relating to the public defence, which might be useful to the enemy, shall be punished by death or by imprisonment for not more than 30 years.

Sec. 3. Whoever, when the United States is at war, shall willfully make or convey false reports or false statements with intent to interfere with the operation or success of the military or naval forces of the United States or to promote the success of its enemies and whoever, when the United States is at war, shall willfully cause or attempt to cause insubordination, disloyalty, or refusal of duty, in the military or naval forces of the United States, or shall willfully obstruct the recruiting or enlistment service of the United States, to the injury of the service or of the United States, shall be punished by a fine of not more than $10,000 or imprisonment for not more than 20 years, or both.

Sec. 4. If two or more persons conspire to violate the provisions of sections 2 or 3 of this title, and one or more of such persons does any act to effect the object of the conspiracy, each of the parties to such conspiracy shall be punished as in said sections provided in the case of the doing of the act the accomplishment of which is the object of such conspiracy. Except as above provided conspiracies to commit offences under this title

shall be punished as provided by section 37 of the act to codify, revise, and amend the penal laws of the United States approved March 4, 1909.

Sec. 5. Whoever harbors or conceals any person who he knows, or has reasonable grounds to believe or suspect, has committed, or is about to commit, an offence under this title shall be punished by a fine of not more than $10,000 or by imprisonment for not more than two years, or both.

Sec. 6. The President in time of war or in case of national emergency may by proclamation designate any place other than those set forth in sub-section (a) of section 1 hereof in which anything for the use of the army or navy is being prepared or constructed or stored as a prohibited place for the purposes of this title: *Provided*, That he shall determine that information with respect thereto would be prejudicial to the national defence.

Sec. 7. Nothing contained in this title shall be deemed to limit the jurisdiction of the general courts-martial, military commissions, or naval courts-martial under sections 1342, 1343, and 1624 of the Revised Statutes as amended.

Sec. 8. The provisions of this title shall extend to all territories, possessions, and places subject to the jurisdiction of the United States whether or not contiguous thereto, and offences under this title when committed upon the high seas or elsewhere within the admiralty and maritime jurisdiction of the United States and outside the territorial limits thereof shall be punishable hereunder.

Sec. 9. The act entitled "An act to prevent the disclosure of national-defence secrets," approved March 3, 1911, is hereby repealed.

TITLE II

Vessels in Ports of the United States

Section 1. Whenever the President by proclamation or executive order declares a national emergency to exist by reason of actual or threatened war, insurrection, or invasion, or disturbance or threatened disturbance of the international relations of the United States, the Secretary of the Treasury may make, subject to the approval of the President, rules and regulations governing the anchorage and movement of any vessel, foreign or domestic, in the territorial waters of the United States, may inspect such vessel at any time, place guards thereon, and, if necessary in his opinion in order to secure such vessels from damage or injury, or to prevent damage or injury to any harbor or waters of the United States, or to secure the observance of the rights and obligations of the United States, may take, by and with the consent of the President, for such purposes, full possession and control of such vessel and remove therefrom the officers and crew thereof and all other persons not specially authorized by him to go or remain on board thereof.

Within the territory and waters of the Canal Zone the Governor of the Panama Canal, with the approval of the President, shall exercise all the powers conferred by this section on the Secretary of the Treasury.

Sec. 2. If any owner, agent, master, officer, or person in charge, or any member of the crew of any such vessel fails to comply with any regulation or rule issued or order given by the Secretary of the Treasury or the Governor of the Panama Canal under the provisions of this title, or obstructs or interferes with the exercise of any power conferred by this title, the vessel, together with her tackle, apparel, furniture, and equipment, shall be subject to seizure and forfeiture to the United States in the same manner as merchandise is forfeited for violation of the customs revenue laws; and the person guilty of such failure, obstruction, or interference shall be fined not more than $10,000, or imprisoned not more than two years, or both.

Sec. 3. It shall be unlawful for the owner or master or any other person in charge or command of any private vessel, foreign or domestic, or for

any member of the crew or other person, within the territorial waters of the United States, willfully to cause or permit the destruction or injury of such vessel or knowingly to permit said vessel to be used as a place of resort for any person conspiring with another or preparing to commit any offence against the United States, or in violation of the treaties of the United States or of the obligations of the United States under the law of nations, or to defraud the United States, or knowingly to permit such vessels to be used in violation of the rights and obligations of the United States under the law of nations and in case such vessel shall be so used, with the knowledge of the owner or master or other person in charge or command thereof, the vessel, together, with her tackle, apparel, furniture, and equipment, shall be subject to seizure and forfeiture to the United States in the same manner as merchandise is forfeited for violation of the customs revenue laws; and whoever violates this section shall be fined not more than $10,000 or imprisoned not more than two years, or both.

Sec. 4. The President may employ such part of the land or naval forces of the United States as he may deem necessary to carry out the purpose of this title.

TITLE III

Injuring Vessels Engaged in Foreign Commerce

Section 1. Whoever shall set fire to any vessel of foreign registry, or any vessel of American registry entitled to engage in commerce with foreign nations, or to any vessel of the United States as defined in Section 310 of the act of March 4, 1909, entitled "An act to codify, revise, and amend the penal laws of the United States," or to the cargo of the same, or shall tamper with the motive power or instrumentalities of navigation of such vessel, or shall place bombs or explosives in or upon such vessel, or shall do any other act to or upon such vessel while within the jurisdiction of the United States, or, if such vessel is of American registry, while she is on the high seas, with intent to injure or endanger the safety of the vessel or of her cargo, or of persons on board, whether the injury or danger is so intended to take place within the jurisdiction of the United States, or after the vessel shall have departed therefrom; or whoever shall attempt or conspire to do any such acts with such intent, shall be fined not more than $10,000 or imprisoned not more than 20 years, or both.

TITLE IV

Interference with Foreign Commerce by Violent Means

Section 1. Whoever, with intent to prevent, interfere with, or obstruct or attempt to prevent, interfere with, or obstruct the exportation to foreign countries of articles from the United States shall injure or destroy, by fire or explosives, such articles or the places where they may be while in such foreign commerce, shall be fined not more than $10,000, or imprisoned not more than 10 years, or both.

TITLE V

Enforcement of Neutrality

Section 1. During a war in which the United States is a neutral nation, the President, or any person thereunto authorized by him, may withhold clearance from or to any vessel, domestic or foreign, which is required by law to secure clearance before departing from port or from the jurisdiction of the United States, or, by service of formal notice upon the owner, master, or person in command or having charge of any domestic vessel not required by law to secure clearances before so departing, to forbid its departure from port or from the jurisdiction of the United States whenever there is reasonable cause to believe that any such vessel, domestic or

foreign, whether requiring clearance or not, is about to carry fuel, arms, ammunition, men, supplies, dispatches, or information to any warship, tender, or supply ship of a foreign belligerent nation in violation of the laws, treaties, or obligations of the United States under the law of nations; and it shall thereupon be unlawful for such vessel to depart.

Sec. 2. During a war in which the United States is a neutral nation, the President, or any person thereunto authorized by him, may detain any armed vessel owned wholly or in part by American citizens, or any vessel, domestic or foreign (other than one which has entered the ports of the United States as a public vessel), which is manifestly built for warlike purposes or has been converted or adapted from a private vessel to one suitable for warlike use, until the owner or master, or person having charge of such vessel, shall furnish proof satisfactory to the President, or to the person duly authorized by him, that the vessel will not be employed by the said owners, or master, or person having charge thereof, to cruise against or commit or attempt to commit hostilities upon the subjects, citizens or property of any foreign prince or state, or of any colony, district, or people with which the United States is at peace, and that the said vessel wll not be sold or delivered to any belligerent nation, or to an agent, officer, or citizen of such nation, by them or any of them, within the jurisdiction of the United States, or, having left that jurisdiction, upon the high seas.

Sec. 3. During a war in which the United States is a neutral nation, it shall be unlawful to send out of the jurisdiction of the United States any vessel built, armed, or equipped as a vessel of war, or converted from a private vessel into a vessel of war, with any intent or under any agreement or contract, written or oral, that such vessel shall be delivered to a belligerent nation, or to an agent, officer, or citizen of such nation after its departure from the jurisdiction of the United States.

Sec. 4. During a war in which the United States is a neutral nation, in addition to the facts required by Sections 4197, 4198, and 4200 of the Revised Statutes to be set out in the masters' and shippers' manifests before clearance will be issued to vessels bound to foreign ports, each of which sections of the Revised Statutes is hereby declared to be and is continued in full force and effect, every master or person having charge or command of any vessel, domestic or foreign, whether requiring clearance or not, before departure of such vessel from port shall deliver to the collector of customs for the district wherein such vessel is then located a statement duly verified by oath, that the cargo or any part of the cargo is or is not to be delivered to other vessels in port or to be transshipped on the high seas and, if it is to be so delivered or transshipped, stating the kind and quantities and the value of the total quantity of each kind of article so to be delivered or transshipped, and the name of person, corporation, vessel or government, to whom the delivery or transshipment is to be made; and the owners, shippers, or consignors of the cargo of such vessel shall in the same manner and under the same conditions deliver to the collector like statements under oath as to the cargo or the parts thereof laden or shipped by them, respectively.

Sec. 5. Whenever it appears that the vessel is not entitled to clearance or whenever there is reasonable cause to believe that the additional statements under oath required in the foregoing section are false, the collector of customs for the district in which the vessel is located may, subject to review by the Secretary of Commerce, refuse clearance to any vessel, domestic or foreign, and by formal notice served upon the owners, master, or person or persons in command or charge of any domestic vessel for which clearance is not required by law, forbid the departure of the vessel from the port or from the jurisdiction of the United States; and it shall thereupon be unlawful for the vessel to depart.

Sec. 6. Whoever, in violation of any of the provisions of this title, shall take, or attempt or conspire to take, or authorize the taking of any

such vessel out of port or from the jurisdiction of the United States, shall be fined not more than $10,000 or imprisoned not more than five years, or both; and, in addition, such vessel, her tackle, apparel, furniture, equipment and her cargo shall be forfeited to the United States.

Sec. 7. Whoever, being a person belonging to the armed land or naval forces of a belligerent nation or belligerent faction of any nation and being interned in the United States, in accordance with the law of nations, shall leave or attempt to leave said jurisdiction, or shall leave or attempt to leave the limits of internment in which freedom of movement has been allowed, without permission from the proper official of the United States in charge, or shall willfully overstay a leave of absence granted by such official, shall be subject to arrest by any marshal or deputy marshal of the United States, or by the military or naval authorities, and shall be returned to the place of internment and there confined and safely kept for such period of time as the official of the United States in charge shall direct; and whoever, within the jurisdiction of the United States and subject thereto, shall aid or entice any interned person to escape or attempt to escape from the jurisdiction of the United States, or from the limits of internment prescribed, shall be fined not more than $1000 or imprisoned not more than one year, or both.

Sec. 8. Section 13 of the act entitled "An act to codify, revise, and amend the penal laws of the United States," approved March 4, 1909, is hereby amended so as to read as follows:

"Sec. 13. Whoever, within the territory or jurisdiction of the United States or of any of its possessions, knowingly begins or sets on foot or provides or prepares a means for or furnishes the money for, or who takes part in, any military or naval expedition or enterprise to be carried on from thence against the territory, or dominion of any foreign prince or state, or of any colony, district, or people with whom the United States is at peace, shall be fined not more than $3000 or imprisoned not more than three years, or both."

Sec. 9. That the President may employ such part of the land or naval forces of the United States as he may deem necessary to carry out the purposes of this title.

Sec. 10. Section 15 of the act entitled "An act to codify, revise, and amend the penal laws of the United States," approved March 4, 1909, is hereby amended so as to read as follows:

"Sec. 15. It shall be lawful for the President to employ such part of the land or naval forces of the United States, or of the militia thereof, as he may deem necessary to compel any foreign vessel to depart from the United States or any of its possessions in all cases in which, by the law of nations or the treaties of the United States, it ought not to remain, and to detain or prevent any foreign vessel from so departing in all cases in which, by the law of nations or the treaties of the United States, it is not entitled to depart."

Sec. 11. The joint resolution approved March 4, 1915, "to empower the President to better enforce and maintain the neutrality of the United States," and any act or parts of acts in conflict with the provisions of this title are hereby repealed.

TITLE VI

Seizure of Arms and Other Articles Intended for Export

Section 1. Whenever an attempt is made to export or ship from or take out of the United States any arms or munitions of war, or other articles, in violation of law, or whenever there shall be known or probable cause to believe that any such arms or munitions of war, or other articles, are being or are intended to be exported, or shipped from, or taken out of the United States, in violation of law, the several collectors, naval officers, surveyors, inspectors of customs, and marshals, and deputy marshals of the United States, and every other person duly authorized for the purpose

by the President, may seize and detain any articles or munitions of war about to be exported or shipped from, or taken out of the United States, in violation of law, and the vessels or vehicles containing the same, and retain possession thereof until released or disposed of as hereinafter directed. If upon due inquiry as hereinafter provided, the property seized shall appear to have been about to be so unlawfully exported, shipped from, or taken out of the United States, the same shall be forfeited to the United States.

Sec. 2. It shall be the duty of the person making any seizure under this title to apply, with due diligence, to the judge of the district court of the United States, or to the judge of the United States district court of the Canal Zone, or to the judge of a court of first instance in the Philippine Islands, having jurisdiction over the place within which the seizure is made, for a warrant to justify the further detention of the property so seized, which warrant shall be granted only on oath or affirmation showing that there is known or probable cause to believe that the property seized is being or is intended to be exported or shipped from or taken out of the United States in violation of law; and if the judge refuses to issue the warrant, or application therefor is not made by the person making the seizure within a reasonable time, not exceeding 10 days after the seizure, the property shall forthwith be restored to the owner or person from whom seized. If the judge is satisfied that the seizure was justified under the provisions of this title and issues his warrant accordingly, then property shall be detained by the person seizing it until the President, who is hereby expressly authorized so to do, orders it to be restored to the owner or claimant, or until it is discharged in due course of law on petition of the claimant, or on trial of condemnation proceedings, as hereinafter provided.

Sec. 3. The owner or claimant of any property seized under this title may, at any time before condemnation proceedings have been instituted, as hereinafter provided, file his petition for its restoration in the district court of the United States, or the district court of the Canal Zone, or the court of first instance in the Philippine Islands, having jurisdiction over the place in which the seizure was made, whereupon the court shall advance the cause for hearing and determination with all possible dispatch, and, after causing notice to be given to the United States attorney for the district and to the person making the seizure, shall proceed to hear and decide whether the property seized shall be restored to the petitioner or forfeited to the United States.

Sec. 4. Whenever the person making any seizure under this title applies for and obtains a warrant for the detention of the property, and (a) upon the hearing and determination of the petition of the owner or claimant restoration is denied, or (b) the owner or claimant fails to file a petition for restoration within 30 days after the seizure, the United States attorney for the district wherein it was seized, upon direction of the attorney general, shall institute libel proceedings in the United States court or the district court of the Canal Zone or the court of first instance of the Philippine Islands having jurisdiction over the place wherein the seizure was made, against the property for condemnation; and if, after trial and hearing of the issues involved, the property is condemned, it shall be disposed of by sale and the proceeds thereof, less the legal costs and charges, paid into the Treasury.

Sec. 5. The proceedings in such summary trials upon the petition of the owner or claimant of the property seized, as well as in the libel cases herein provided for, shall conform, as near as may be, to the proceedings in admiralty, except that either party may demand trial by jury of any issue of fact joined in such libel cases, and all such proceedings shall be at the suit of and in the name of the United States: Provided, That upon the payment of the costs and legal expenses of both the summary trials and the libel proceedings herein provided for, and the execution and delivery of a good and sufficient bond in an amount double the value of the property

seized, conditioned that it will not be exported or used or employed contrary to the provisions of this title, the court, in its discretion, may direct that it be delivered to the owners thereof or to the claimants thereof.

Sec. 6. Except in those cases in which the exportation of arms and munitions of war or other articles is forbidden by proclamation or otherwise by the President, as provided in Section 1 of this title, nothing herein contained shall be construed to extend to, or interfere with any trade in such commodities, conducted with any foreign port or place wheresoever, or with any other trade which might have been lawfully carried on before the passage of this title, under the law of nations, or under the treaties or conventions entered into by the United States, or under the laws thereof.

Sec. 7. Upon payment of the costs and legal expenses incurred in any such summary trial for possession or libel proceedings, the President is hereby authorized, in his discretion, to order the release and restoration to the owner or claimant, as the case may be, of any property seized or condemned under the provisions of this title.

Sec. 8. The President may employ such part of the land or naval forces of the United States as he may deem necessary to carry out the purposes of this title.

TITLE VII

Certain Exports in Time of War Unlawful

Section 1. Whenever during the present war the President shall find that the public safety shall so require, and shall make proclamation thereof, it shall be unlawful to export from or ship from or take out of the United States to any country named in such proclamation any article or articles mentioned in such proclamation, except at such time or times, and under such regulations and order, and subject to such limitations and exceptions as the President shall prescribe, until otherwise ordered by the President or by Congress: Provided, however, That no preference shall be given to the ports of one state over those of another.

Sec. 2. Any person who shall export, ship, or take out, or deliver or attempt to deliver for export, shipment, or taking out, any article in violation of this title, or of any regulation or order made hereunder shall be fined not more than $10,000, or, if a neutral person, imprisoned for not more than two years, or both; and any article so delivered or exported, shipped or taken out, or so attempted to be delivered or exported, shipped, or taken out, shall be seized and forfeited to the United States; and any officer, director, or agent of a corporation who participates in any such violation shall be liable to like fine or imprisonment, or both.

Sec. 3. Whenever there is reasonable cause to believe that any vessel, domestic or foreign, is about to carry out of the United States any article or articles in violation of the provisions of this title, the collector of customs for the district in which such vessel is located is hereby authorized and empowered, subject to review by the Secretary of Commerce, to refuse clearance to any such vessel, domestic or foreign, for which clearance is required by law, and by formal notice served upon the owners, masters, master, or person or persons in command or charge of any domestic vessel for which clearance is not required by law, to forbid the departure of such vessel from the port, and it shall thereupon be unlawful for such vessel to depart. Whoever, in violation of any of the provisions of this section shall take, or attempt to take, or authorize the taking of any such vessel, out of port or from the jurisdiction of the United States shall be fined not more than $10,000 or imprisoned not more than two years, or both; and, in addition, such vessel, her tackle, apparel, furniture, equipment, and her forbidden cargo shall be forfeited to the United States.

TITLE VIII

Disturbance of Foreign Relations

Section 1. Whoever, in relation to any dispute or controversy between a foreign government and the United States, shall willfully and knowingly make any untrue statement, either orally or in writing, under oath before any person authorized and empowered to administer oaths, which the affiant has knowledge or reason to believe will, or may be used to influence the measure or conduct of any foreign government, or of any officer or agent of any foreign government, to the injury of the United States, or with a view or intent to influence any measure of or action by the government of the United States, or any branch thereof, to the injury of the United States, shall be fined not more than $5000 or imprisoned not more than five years, or both.

Sec. 2. Whoever within the jurisdiction of the United States shall falsely assume or pretend to be a diplomatic or consular, or other official of a foreign government duly accredited as such to the government of the United States with intent to defraud such foreign government or any person, and shall take upon himself to act as such, or in such pretended character shall demand or obtain, or attempt to obtain from any person or from said foreign government, or from any officer thereof, any money, paper, document, or other thing of value, shall be fined not more than $5000, or imprisoned not more than five years, or both.

Sec. 3. Whoever, other than a diplomatic or consular officer or attache, shall act in the United States as an agent of a foreign government without prior notification to the Secretary of State shall be fined not more than $5000, or imprisoned not more than five years, or both.

Sec. 4. The words "foreign government," as used in this act and in Sections 156, 157, 161, 170, 171, 172, 173, and 220 of the act of March 4, 1909, entitled "An act to codify, revise, and amend the penal laws of the United States," shall be deemed to include any government, faction, or body of insurgents within a country with which the United States is at peace, which government, faction, or body of insurgents may or may not have been recognized by the United States as a government.

Sec. 5. If two or more persons within the jurisdiction of the United States conspire to injure or destroy specific property situated within a foreign country and belonging to a foreign government or to any political subdivision thereof with which the United States is at peace, or any railroad, canal, bridge, or other public utility so situated, and if one or more of such persons commits an act within the jurisdiction of the United States to effect the object of the conspiracy, each of the parties to the conspiracy shall be fined not more than $5000, or imprisoned not more than three years, or both. Any indictment, or information under this section shall describe the specific property which it was the object of the conspiracy to injure or destroy.

TITLE IX

Passports

Section 1. Before a passport is issued to any person by or under authority of the United States such person shall subscribe to and submit a written application duly verified by his oath before a person authorized and empowered to administer oaths, which said application shall contain a true recital of each and every matter of fact which may be required by law or by any rules authorized by law to be stated as a prerequisite to the issuance of any such passport. Clerks of the United States courts, agents of the Department of State, or other Federal officials authorized, or who may be authorized, to take passport applications and administer oaths thereon, shall collect, for all services in connection therewith, a fee of $1, and no more, in lieu of all fees prescribed by any statute of the United

States, whether the application is executed singly, in duplicate, or in triplicate.

Sec. 2. Whoever shall willfully and knowingly make any false statement in application for passport with intent to induce or secure the issuance of a passport under the authority of the United States, either for his own use or the use of another, contrary to the laws regulating the issuance of passports, or the rules prescribed pursuant to such laws, or whoever shall willfully and knowingly use or attempt to use, or furnish to another for use, any passport the issue of which was secured in any way by reason of any false statement, shall be fined not more than $2000 or imprisoned not more than five years, or both.

Sec. 3. Whoever shall willfully and knowingly use, or attempt to use, any passport issued or designed for the use of another than himself, or whoever shall willfully and knowingly use or attempt to use any passport in violation of the conditions or restrictions therein contained, or of the rules prescribed pursuant to the laws regulating the issuance of passports, which said rules shall be printed on the passport; or whoever shall willfully and knowingly furnish, dispose of, or deliver a passport to any person, for use by another than the person for whose use it was originally issued and designed, shall be fined not more than $2000 or imprisoned not more than five years, or both.

Sec. 4. Whoever shall falsely make, forge, counterfeit, mutilate, or alter, or cause or procure to be falsely made, forged, counterfeited, mutilated, or altered any passport or instrument purporting to be a passport, with intent to use the same, or with intent that the same may be used by another; or whoever shall willfully and knowingly use, or attempt to use, or furnish to another for use any such false, forged, counterfeited, mutilated, or altered passport or instrument purporting to be a passport, or any passport validly issued which has become void by the occurrence of any condition therein prescribed invalidating the same, shall be fined not more than $2000 or imprisoned not more than five years, or both.

TITLE X

Counterfeiting Government Seal * * *

TITLE XI

Search Warrants

Section 1. A search warrant authorized by this title may be issued by a judge of a United States district court, or by a judge of a state or territorial court record, or by a United States commissioner for the district wherein the property sought is located. * * *

TITLE XII

Use of Mails

Section 1. Every letter, writing, circular, postal card, picture, print, engraving, photograph, newspaper, pamphlet, book, or other publication, matter, or thing, of any kind, in violation of any of the provisions of this act, is hereby declared to be nonmailable matter and shall not be conveyed in the mails or delivered from any post office or by any letter carrier: Provided, That nothing in this act shall be so construed as to authorize any person other than an employe of the Dead Letter Office, duly authorized thereto, or other person upon a search warrant authorized by law, to open any letter not addressed to himself.

Sec. 2. Every letter, writing, circular, postal card, picture, print, engraving, photograph, newspaper, pamphlet, book, or other publication, matter or thing, of any kind, containing any matter advocating or urging treason, insurrection, or forcible resistance to any law of the United States, is hereby declared to be nonmailable.

Sec. 3. Whoever shall use or attempt to use the mails or postal service of the United States for the transmission of any matter declared by this title to be nonmailable shall be fined not more than $5000, or imprisoned not more than five years, or both. Any person violating any provision of this title may be tried and punished either in the district in which the unlawful matter or publication was mailed, or to which it was carried by mail for delivery accordingly to the direction thereon, or in which it was caused to be delievered by mail to the person to whom it was addressed.

TITLE XIII

General Provisions

Section 1. The term "United States" as used in this act includes the Canal Zone and all territory and waters, continental or insular, subject to the jurisdiction of the United States.

Sec. 2. The several courts of first instance in the Philippine Islands and the district court of the Canal Zone shall have jurisdiction of offences under this act committed within their respective districts, and concurrent jurisdiction with the district courts of the United States of offences under this act committed upon the high seas, and of conspiracies to commit such offences, as defined by Section 37 of the act entitled "An act to codify, revise, and amend the penal laws of the United States," approved March 4, 1909, and the provisions of said section, for the purpose of this act, are hereby extended to the Philippine Islands and to the Canal Zone. In such cases the district attorneys of the Philippine Islands and of the Canal Zone shall have the powers and perform the duties provided in this act for United States attorneys.

Sec. 3. Offences committed and penalties, forfeitures, or liabilities incurred prior to the taking effect hereof under any law embraced in or changed, modified, or repealed by any chapter or this act may be prosecuted and punished, and suits and proceedings for cases arising or acts done or committed prior to the taking effect hereof may be commenced and prosecuted in the same manner and with the same effect as if this act had not been passed.

Sec. 4. If any clause, sentence, paragraph, or part of this act shall for any reason be adjudged by any court of competent jurisdiction to be invalid, such judgment shall not affect, impair, or invalidate the remainder thereof, but shall be confined in its operation to the clause, sentence, paragraph, or part thereof directly involved in the controversy in which such judgment shall have been rendered.—*Army and Navy Register*, 9/6.

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NAVAL WAR NOTES

Prepared by Lieutenant I. C. Kidd, U. S. Navy

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STRATEGY OF THE WAR

German Effort to Obtain Base in Caribbean.—The purpose of the German Government to extend the radius of submarine warfare to American waters is disclosed in reports to the State Department of German efforts to obtain control of the island of Margarita, off the north coast of Venezuela, for use as a naval base.

Negotiations are being carried on either by the German Government or German subjects obviously acting as its agents.

The island, with its adjacent waters, including the Gulf of Cariaco, is admirably adapted for use as a submarine base, and lies almost on the direct route to the Panama Canal. It is near the southeastern corner of the Caribbean Sea, 500 miles from Culebra and 1000 miles from Colon.

The information in the possession of the State Department has been brought to the attention of President Gomez, who has been at the head of the Venezuelan Government virtually since the downfall of Cipriano Castro. It is assumed that more formal action in the nature of a protest will be unnecessary and that prompt measures will be taken to suppress the conspiracy.

These and other reports of German activity in the southern republic have been the occasion for some concern on the part of State Department officials. Although they have declined to discuss the reports of the project for the establishment of a submarine base on Margarita Island, it is known that German agents have for some time been active in Venezuela and that in some instances they have come to wield some influence upon public affairs.

The transfer of the control of the island of Margarita to Germany would not be countenanced by the United States for two reasons. It would constitute a violation of the Monroe Doctrine, in the assertion of which for the preservation of the territorial integrity of Venezuela the United States once ran the risk of war with Great Britain. At the present juncture it also would constitute almost an act of hostility toward the United States as well as the other American republics that are at war with Germany.

It is probable that not only the United States but the other governments of North and South America subscribing to the doctrine of Pan-Americanism would block any move to afford Germany a foothold upon the western continents or a naval base from which it could harass the shipping, neutral as well as belligerent, following so important a trade route as the Panama Canal.

The purchase of the Danish West Indies, now the Virgin Islands, was made by the United States primarily for the purpose of closing the opportunity to Germany, which had cast covetous eyes in that direction. It has been understood also that a scheme to obtain control of the island of Curaçao, in the Dutch West Indies, has long been under consideration by the Prussian diplomats. The policy of preempting the Caribbean waters was undertaken long ago by the United States to checkmate any such move.

The Monroe Doctrine has been so plain that it required no specific declaration as a warning that the sale of territory in American waters would be regarded with absolute disapproval by the United States. So long as relations with the German Government remained unbroken Germany apparently confined its aims to territory already in the possession of European nations such as Holland and Denmark.

Since the declaration of war she has thrown off this restraint. There have been rumors, which have been officially denied, of wireless stations in Colombia and Mexico, and activities in some of the southern republics have been looked upon with askance, although there has been no hint of the disturbance of official relationships.

So far there have been no indications that the governments of South and Central America are more inclined to abandon the doctrine of Pan-Americanism than the United States is prepared to relax its vigilance in the maintenance of the Monroe Doctrine. The establishment of a German submarine base in the Caribbean would not only constitute a menace to future peace, but probably would result in heavy losses to shipping, which has already paid heavy toll to the submarines. It is improbable that Brazil and Chile would contemplate the spread of submarine warfare to American waters with any less alarm than the United States and other belligerents.

There has been no reason to doubt the friendliness of the Gomez régime in Venezuela. No Latin-American country has been more befriended by the United States which came to its rescue when threatened with invasion and repeatedly prevented the dictator Castro after his deposition from returning to foment insurrection against the Gomez government itself.—*N. Y. Herald*, 3/6.

CARACAS, VENEZUELA, May 22, 1917.

General Juan Vicente Gomez, President-elect of Venezuela, who steadfastly has refused to take office officially, is completely under the influence of German interests, according to all indications and to some of the most competent observers of the Venezuelan situation. General Gomez, while nominally President-elect, is in reality dictator.

Despite strong pro-Entente sentiment among Venezuelans Gomez is resolutely opposed to breaking diplomatic relations with Germany, or even to having anything done which might offend that power. A few days ago the editor of a Caracas newspaper, who was ill, was taken from his bed and put in prison because he had permitted the publication of an article anti-German in sentiment.

The fact that Gomez's attitude is in utter disregard of that of the vast majority of the people has caused widespread discontent in Venezuela. People are expressing more openly than ever before their dissatisfaction.

Ask United States' Aid.—Recently a group of citizens of Valencia, the second city of importance in Venezuela, met and drafted an anonymous manifesto calling on the United States to put an end to the long existing period of misrule in Venezuela and to establish "a decent government." Valencia is only 35 miles from Maracay, where General Gomez lives on his extensive plantations and maintains military headquarters.

In the country about Valencia and Maracay many plantations have had to suspend work on account of their laborers being impressed into the ranks of the organizing revolutionists. Rumors are in circulation concerning the arrival of shipments of arms and ammunition at Venezuelan ports for the use of the latter. It is rumored also that revolutionists are in possession

of the newly constructed highway from Maracay to Ocumare de la Costa, which Gomez had built at great cost for strategic reasons.

Gomez Ready to Flee.—In the port of Ocumare de la Costa Gomez maintains a steam launch, which could carry him speedily to Curaçao in the event he should be forced to flee.

Many prominent Venezuelans and foreigners have received by registered mail from New York copies of a circular denouncing Gomez for his imprisonment of hundreds of persons for no better reason than that he considers them of less danger to him in prison than out.

A few weeks ago Gomez, with all the members of the Cabinet and leading government officials, started on a much heralded automobile trip to remote parts of Venezuela, that was arranged to last a fortnight. The main objective was the town of San Fernando de Apure, where an elaborate international exchange of courtesies had been arranged with representatives of Colombia to celebrate the present era of good feeling between the two countries as a result of the settlement of the boundary dispute. When four days out from Caracas, however, Gomez received disquieting news that caused him to fear the outbreak of a revolution during his absence in the wilds, so he returned post haste to the capital without going as far as San Fernando de Apure.

Bolivian Minister Slighted.—The Bolivian Minister to Venezuela has made repeated efforts to get an audience with Gomez to present an autograph letter from the President of Bolivia, but Gomez has put him off, supposedly because he thought that the letter was in the nature of pressure upon him to follow the course of Bolivia in breaking relations with Germany. Two appointments were made for the Bolivian Minister to go to Maracay to see Gomez, and each was broken at the eleventh hour, the excuse given to the Minister on the second occasion being that Gomez had an engagement to attend a cock fight. The Minister has just left Venezuela in disgust, presumably to go to Colombia, to which he also is accredited.

On April 7 there was published in the press of the United States the statement that the Argentine Republic had issued a call for a conference of American republics to discuss the rights of neutrals, the United States being omitted from the invitation on the ground that it was already at war. Venezuela also was omitted, on the assumption that she was so bound to the United States that she might feel inclined to follow its lead. From four to six weeks later, however, when in a belated message to Congress the Provisional President indicated that the government of Venezuela would follow a course of neutrality, although a proclamation to that effect has not yet been issued, a cordial invitation was addressed by the Argentine Government to Venezuela. The latter declined it, ostensibly so as not to offend the United States, but with the real motive simply of wishing to avoid responsibility.—*N. Y. Herald,* 4/6.

WORK OF NAVY IN EUROPEAN WATERS TO BE KEPT SECRET.—In harmony with the British policy of keeping the German Government as much in the dark as possible concerning the progress of the submarine campaign, the Navy Department will not make public detailed reports of the operations of American destroyers now on patrol duty in European waters. Intimations were forthcoming at the Navy Department that an agreement to this effect had been reached in the recent conferences with the British naval representative accompanying the Balfour mission.

It is the obvious purpose of the United States to act in full accord with the British Admiralty in this respect, inasmuch as the American destroyers are operating from British bases under the general direction of Vice Admiral Sims, who is in constant touch with the Admiralty officers. Germany is not to know what measure of damage has been inflicted by her submarines or what damage has been inflicted upon them. Only when the undersea vessels fail to return to port will it be definitely known to them that they have been captured or destroyed.

Since the steaming of the American vessels there have been repeated rumors of the destruction of one or another of them, but these have been met with the statement at the Navy Department that no information to that effect has been received. It is not probable that information concerning the destruction of American ships will be regarded as essential to the scheme of military secrecy. The British Admiralty has promptly announced, as a rule, the sinking of warships. So far there is no reason for believing that any of the destroyers sent over from this side of the Atlantic have met with misfortune.

The statement of Lloyd George in the House of Commons that effective assistance has been rendered by the American craft in bringing about a reduction of submarine losses brought forth no comment from Secretary Daniels. He intimated that there was nothing to be said yet and that nothing would be said officially until some time later, when there was more occasion for making known exactly what was being accomplished.

Whatever the success of the campaign against the submarines neither the United States nor any of the allied countries are relaxing their efforts to obtain shipping to traverse the war zone. It became known that methods for forcing Norwegian vessels now held in port to take their share of the war risk has been under consideration. Norway is very much in need of coal, and it is probable that to obtain it from the United States or any of the allied countries she must use her own ships.—*New York Herald*, 28/5.

EFFECT WERE NORWAY TO JOIN THE ALLIES.—A London dispatch to the *N. Y. Times* says:

"*Land and Water* publishes an American number devoted to articles on the entry of the United States into the war. Arthur Pollen, writing on American naval co-operation and discussing the possibility that the German submarine warfare may bring Norway in on the side of the Allies, says:

"'With 18 battleships whose aggregate gun power is vastly superior to that of the whole German battle and battle cruiser fleet, the Americans are in a position, should Norway elect for belligerency, to establish a North Sea base directly threatening both the Sound, Heligoland and the exits of the German fleet, which would have a far more profound effect on North Sea strategy than the mere menace of the German battle fleet implies. For it must not be forgotten that one of the main advantages that the enemy has derived from the neutrality of the Scandinavians is his liberty to use their territorial waters either for running cargoes directly into his own harbors or into those of countries powerless to resist his demand that contraband should be shipped through to him.

"'With Norwegian territorial waters no longer neutral, and with the Sound no longer an open passage, the problem of a closer blockade is entirely revolutionized. Add to this that American belligerency gives to the alliance a new power of checking the shipping of supplies ultimately destined for the enemy, and an entirely new situation is created.

"'But there is another question to which attention has been directed here more than once during the last six months, and that is the possibility of direct offensive operations against German bases. I am still of the opinion that such operations cannot be undertaken with any hope of success without special preparations which may take six months or more to complete. The character of those preparations, the special construction which they will involve, the demands they will make on the ship building, gun-making and munition producing capacities of the older and new belligerents, need not be specified; but it is clear that here again the whole character of the problem is changed by the fact that the American Navy is ready to take a most active part.'

"Another article in *Land and Water* by 'An Onlooker in America,' dealing with American unpreparedness for war, says:

"'Superficially the parallel between England in 1914 and conditions in the United States to-day is as striking as it is depressing. There is the same amateurishness in government circles, the same "life as usual" atmosphere, somewhat disturbed by hysteria, throughout the country. One looks in vain for a sign of any great national impulse; one realizes that the American public, like the British public before the war, has had its moral and physical energies dulled by a too steady peace and too assiduous worship at the altars of a sheltered individualism. The United States, in fact, is suffering from too much liberalism of the pacifist domestic reform variety.

"'The United States has not yet got a war government, any more than Great Britain had one at the start, and long after the start. There is much confusion in Washington. The department spirit is willing, but the organization weak. Professional politicians and bureaucrats jostle each other hopelessly. The War Department has yet to get down to business. The Navy Department, while it has a better instrument to work with, has not yet laid its plans for co-operation with the Allies as they would have been laid in Utopia. It may be doubted, in fact, whether, outside of finance, the immediate result of the Balfour and Viviani missions will be quite what an enthusiastic press expects.'"

PRAISE FOR THE AID OF OUR NAVY

In its editorial article, however, *Land and Water* does not support these views. It says:

"As a nation the United States has thrown its full force into this struggle for righteousness. Its destroyers open a lane of security for our food ships; its stupendous wealth is placed at the disposal of its allies, and the financial future rendered free from harrassing doubt. The organization of its food supplies has been taken in hand, and it will not be long before the first companies of its armies are training in those wonderful schools for war that have been formed in France. . . . .

"It is nearly two months since America took up arms, and already she has made her power apparent on the sea, and the first signs of it on land are visible. There has been no waste of time, but, as all fighting nations have found to their cost—Germany among them—war cannot be rushed if victory be the goal."

NORTH SEA AND CHANNEL

THE ZEEBRUGGE BOMBARDMENT.—One of the most puzzling things in the present war is the apparent discontinuity of effort. An attempt is made to act along certain strategic or tactical lines, but the effort appears to expire with the first occasion. This is particularly the case with naval operations, and the public, which does not see the enormous amount of policing of the seas which is done by our ships, cannot understand why we do not do something more definite in the way of attacking the enemy. For example, earlier in the war the monitors bombarded the German positions on the Belgian coast very severely and, it is to be presumed, with good effect. After that we had occasional raids on Zeebrugge, but these had ceased for a lengthy period when they were apparently renewed by the combined sea and air bombardment which took place on the 12th instant.

The question now seems to arise why, if a two hours' bombardment was possible on May 12, it was not possible on April 12, 19, and 26? In fact why has not Zeebrugge by this time been destroyed by successive bombardments since the first? It may be objected that to go on with the bombardment would show the enemy that the place was seriously threatened, and lead to a heavy strengthening of its defences. This hardly seems to be a valid argument, since if the place is of naval importance to the Germans they will doubtless make every effort to render it safe. In any case a series of bombardments at short intervals ought to be more destructive than two or three at intervals of years.

There would appear to be some reliance on the opinion of Sir Edward Meux, who warns us that we cannot get at the German submarines because they are in impregnable harbors which it would be folly to attack. Yet the Admiralty announce that a very heavy bombardment of an important area was successfully carried out, and an unnamed correspondent explains this important area and success by saying that two submarine sheds were blown up. Are there a large number of German submarines based on Zeebrugge, and if so is Zeebrugge impregnable in the sense that the submarines and their lairs cannot be damaged?

It is noteworthy that this bombardment was carried out under the orders of the Vice-Admiral, Dover. The question then may be asked in all sincerity, and with no desire to embarrass the authorities, whether such bombardments cannot become much more frequent than they have been of late. Zeebrugge is a notorious starting-off base for submarines and Zeppelins. Why not then make it untenable? Are we really at war or only playing a game?—*United Service Gazette*, 24/5.

FRENCH AND GERMAN DESTROYER ENGAGEMENT.—An official Berlin report says:

"An engagement between German and French torpedo-boats off the coast of Flanders is reported in an official announcement from the Admiralty. The announcement says:

"'On the morning of May 20, off the coast of Flanders, a short outpost engagement took place between German and French torpedo-boats. The enemy boats were repeatedly hit by our artillery and our vessels returned without losses or damage.'"

The French official statement issued reported that a flotilla of German destroyers had been driven back to its base by a patrol of four French torpedo-boats. The statement said that one of the French vessels had suffered some damage.—*N. Y. Times*, 21/5.

FRENCH DESTROYER "BOUTEFEN" LOST.—According to the *Army and Navy Journal*, May 26, the French destroyer *Boutefen* was sunk by a mine during the engagement on May 20.

A Paris despatch to the *N. Y. Herald*, May 22, says:

"The Ministry of Marine has issued the following statement in regard to the naval engagement between French and German destroyers off the coast of Flanders on May 20:

"'According to a fuller report of the engagement on May 20 off Flanders Bank, the enemy, superior in force to the French flotilla, opened fire first but, seeing the French torpedo-boats bearing down upon him with the intention of boarding, he retired at high speed towards his base. The gun-firing lasted for about a quarter of an hour. Lieutenant Bijot, commanding the *Bouclier*, and the navigating officer were killed. Ensign Peyronnet, although wounded in six places, one wound being serious, took over command during the end of the action and brought the ship back to Dunkirk.

"'One of our ships succeeded in avoiding a torpedo fired against her by skilled handling. Attempts made by the enemy to throw our ships into confusion by false signals failed to work. The French flotilla suffered only slight damage and dominated the adversary, who gave up the object with which he set out.'"

ZEPPELIN RAID.—Four or five Prussian airships made a raid on the eastern counties of England May 23, according to an official statement. The airships dropped bombs and escaped, although pursued.

The official statement says:

"Four or five hostile airships approached East Anglin shortly before midnight last night, May 23. The weather was overcast and a thick bank of rainclouds made observation difficult.

"Four airships appear to have penetrated inland into the eastern counties. They followed erratic courses and dropped a number of bombs in country districts, apparently being unable to locate their position. The raiders were pursued by our airplanes, but thick clouds enabled them to make good their escape. One man was killed in a Norfolk village. The material damage is believed to be negligible."—*N. Y. Herald*, 25/5.

COLLISION BETWEEN BRITISH SUBMARINE AND GERMAN U-BOAT.—A submarine collision of a British submarine and a German U-boat is reported by the *Rheinische Westfälische Zeitung* of Essen, which describes the incident as unprecedented.

The paper says that the collision took place "in the Channel" on April 19 and declares that a German U-boat, while submerged, rammed a British submarine; that the British boat emerged, bringing up the German submarine lying across the bows of the British vessel.

The German vessel slid off into the water and both vessels started their engines, and, when separated by about 50 yards, both dived. The commander of the German U-boat did not see the British submarine again.

The paper asserts that both submarines were anxious to fight, but that it was impossible under the circumstances.—*N. Y. Times*, 2/6.

LONDON, June 2.

The report published in the *Rhenische Westfälische Zeitung*, of Essen, that a German submarine, while submerged, rammed a British submarine in the Channel on April 19 has been gossiped about here for some time, the British submarine having returned undamaged.

This was the second incident of the kind this spring. In the previous case a British submarine dived for a rest on the bottom of the sea, and landed squarely on top of a German submarine, similarly at rest, smashing in the German's conning tower. The British craft, undamaged, remained on the helpless German U-boat for several hours, in order to make certain that it was put out of commission. The British boat finally rose to the surface, and dropped a number of bombs to clinch the fate of the Germans. —*Washington Post*, 3/6.

FOLKESTONE RAIDED.—Seventy-six persons were killed and 174 injured, May 25, by a German airplane raid which spent most of its force upon this place. At 6.30 p. m. the people were warned of the approach of danger by a peculiar humming noise from the sky. The first visible warning was a white, shining airplane, high in the air. There was bright sunshine, but a slight mist overspread the sky, and the aircraft could not be seen distinctly. Following it came a formation of five airplanes, and after these others.

As the airplanes passed from west to east they dropped bombs, several of which fell in gardens. One crashed into a tennis court without doing any damage. Most of the victims were in the shopping thoroughfare, which was thronged when a bomb was dropped on it. They were residents of all classes—inoffensive civilians, men getting on in years, women with little ones. They and their homes suffered by this wanton attack on an unprotected town. Of military damage there was absolutely none.

The raiding airplanes were over the town for a very short time—a matter of minutes only. After discharging their bombs they headed seaward, British airplanes following them in hot pursuit. It was a thrilling sight as the chase continued for miles out to sea, with continuous firing, but the raiders apparently got clear away, profiting by their substantial start.

Eye-witnesses agree that the hostile aircraft proceeded in even formation, a scout apparently leading the way. One line of five, and another of seven airplanes were seen to cross over the town, covering a huge area of sky.

An apparently modern estimate of the number of bombs dropped now places the total at 50 or more.

British airplanes went promptly after the raiders, and one of the latters' machine was seen to swerve badly, but whether it was brought down is at present unknown. Some bombs failed to explode.

The following report on the raid was made by Field Marshal Viscount French:

"A large squadron of enemy aircraft—about 16—attacked Southeast England between 5.15 and 6.30 o'clock last evening. Bombs were dropped at a number of places, but nearly all the damage occurred in one town, where some bombs fell into the streets, causing considerable casualties among the civil population. Some shops and houses also were seriously damaged.

"The total casualties reported by the police from all districts are: Killed, 76; injured, 174.

"Of the killed 27 were women and 23 were children, while 43 women and 19 children were injured.

"Aeroplanes of the Royal Flying Corps went in pursuit, and the raiding aircraft were engaged by fighting squadrons of the Royal Naval Air Service from Dunkirk on their return journey. The Admiralty reports that three enemy aeroplanes were shot down by the latter."

The Admiralty statement, referred to by Viscount French, says:

"Naval airplanes attacked the aerodrome at St. Denis Westrem near Bruges, yesterday morning, dropping many bombs.

"In the evening, several enemy aircraft returning from the raid on England were engaged over sea by Royal Naval Air Service machines. An encounter took place between one British and three hostile airplanes in mid-Channel, and one of the latter was destroyed. Several encounters also took place off the Belgian coast, in which two large twin-engined hostile machines were shot down. All our machines returned safely."

Four Successive Attacks.—The attack upon the southeastern coast was methodically organized. The first squadron of five airplanes was followed after short intervals by a second squadron and then a third and fourth, each of which repeated the tactics of the first.

Scarcely any part of the town escaped injury. At least 60 bombs were dropped here, falling in a shower all over the town.

The worst damage done was from a group of bombs which struck the busy business thoroughfare thronged with people. At one spot here 16 women, eight men and nine children were killed, and 42 persons were injured.

The intervals of comparative quiet after the departure of each squadron of raiders were only broken by the sound of distant firing of naval guns out at sea and were even more harrowing to the populace than were the brief periods when the bombs were actually bursting in the town.

For a little over a year the air defence of England has been in charge of Field Marshal Viscount French, Commander in Chief of the home forces. In a report he gave the Secretary for War, when it was believed that Germany, owing to Zeppelin losses, would not again attempt a raid in force, he wrote covering the time from April 1 to November 27, 1916:

"In all, 19 raids have been made by German airships and 17 attacks have been made by airplanes. The damage done has been comparatively small and nothing of any military importance has been effected.

"Taken as a whole, the defensive measures have been successful. In very few cases have the enemy reached their objective. They have been turned, driven off, seriously damaged by gunfire, and attacked with great success by airplanes. Seven have been brought down, either as the result of gunfire or airplane attack, or of both combined.

"The work of the Royal Flying Corps and of the gun and light detachments, including the Royal Naval Anti-Aircraft Corps, has been arduous, and has shown consistent improvement; the guns and lights have been effectively handled, and the pilots of the Royal Flying Corps have shown both skill and daring. All are deserving of high praise. Close cooperation

with the navy has been maintained, and the Royal Naval Air Service, by their constant and arduous patrol work on the coast and overseas, have shared in successful attacks on the enemy."—*N. Y. Times*, 27/5.

LONDON, May 28.

Folkestone was the town where the most damage was done in Friday's (May 25) air raid.—*N. Y. Herald*, 29/5.

BRITISH AIRMEN RESCUED.—The *Daily Mail* (London) says that two British airmen have been landed by a destroyer on the east coast, after being rescued from their wrecked machine.

They had been clinging to the wreck for five days and five nights with a piece of chocolate as their only food.—*Washington Post*, 2/6.

MOTHER SHIP FOR SEAPLANES.—Passengers arriving June 7 at an American port from England stated that a former transatlantic liner of considerable size, which was converted into a mother ship for airplanes and took part in the North Sea fight, was now being used by the British Admiralty in its new campaign to overcome the German submarine menace.

This vessel carres a number of airplanes and cruises round the British coast, waiting to pick up news of the undersea craft. Men are posted at the lofty mastheads on the lookout with powerful glasses, and directly a submarine is sighted an aviator goes up in a seaplane and drops bombs on its track.

In addition the captain of the seaplane ship is kept posted on submarine activities by wireless from the naval stations at various points, and also receives S O S calls that are sent out by the steamships which are being attacked.

In her record-breaking days on the Atlantic the vessel could average 21 knots easily and her speed now is only two knots slower, which is faster than any submarine can steam on the surface.

One American passenger said that he saw the mother ship send out three seaplanes in the English Channel after two submarines that had been reported attacking a big liner about 20 miles away. The day was calm and clear and it was a remarkable sight to see the machines leave the surface of the sea and wing their way aloft like huge albatrosses.

The United States destroyers had proved of great service, he said, in protecting merchant steamships arriving from this country, loaded with grain and food supplies, which were badly needed over there.

No figures had been given out by the Admiralty as to the number of submarines sunk, but the passenger was told at Chatham that the toll averaged 25 a month, which was, it was said, 10 more than the Germans could manufacture and place in the water during that period. The most satisfactory thing was that fewer ships were being sunk when he left England, and the naval officers he met were very cheerful on the subject and assured him that the good work would go on.

The summer is the best time for catching submarines, according to experts, as the daylight continues to nearly 10 o'clock and the motor boat chasers can go out some distance from land to attack their enemies with bombs and deck guns. Smoke bombs and drums, which are dropped overboard and emit dense clouds of smoke after striking the water, have proved very effective in cases where steamships have been pursued by submarines. Practically all the American and British steamships are equipped with them now.—*N. Y. Herald.*

KENT RAID; EIGHT GERMAN AIRPLANES DESTROYED.—Eight out of 18 German airplanes that took part in yesterday's (June 5) air raid on Essex and Kent were driven down by British airmen. Four of these were to a certainty completely destroyed, while two others are believed to have been put totally out of commission.

Of the 18 machines that started in the raid, two were brought down near the British coast after having dropped their bombs, as reported in the official British statement. The remaining 16 were engaged by 10 naval airmen from Dunkirk, who in a great battle over the sea destroyed two more of the Germans and drove down another four, two of which, it is reasonable to believe, according to the official report, were completely put out of action.

After the lesson of the Folkestone raid the British were ready for the visit, and from the moment the Germans left the Belgian coast they were engaged, first with patrols over the Channel, then with the land forces in England, and later, on their return, with the squadron of airplanes from Dunkirk.

The official statement follows:

Yesterday (June 5) four Royal Naval Air Service pilots on patrol off Dunkirk observed about 18 enemy aircraft off Ostend, well out at sea, proceeding in a northwesterly direction. Indecisive engagements took place, and the enemy was chased to England.

On their return journey the enemy were pursued and engaged by a naval machine from an air station on the Kentish coast. Two enemy aircraft were in turn attacked and driven down by this pilot, who then landed at Dunkirk. Other engagements between Royal Naval Air Service machines from home stations and the enemy also took place over the Thames estuary.

Later 10 naval pilots from Dunkirk encountered 16 hostile aircraft off Ostend, returning from their raid on England, and numerous fights took place. Two of these hostile aircraft were completely destroyed and four others were driven down out of control, of which two are considered also to have been destroyed.

In addition to this prompt defensive action, a warning was given the inhabitants of the districts visited, and they were able to take to cover, so that the casualties, while considerable, aggregating 12 killed and 36 wounded, were much smaller than in the case of Folkestone, which had no warning

Anti-aircraft guns and airplanes succeeded in keeping the raiders from the naval and military centers, and the casualties occurred chiefly in small towns and villages, on which bombs were dropped indiscriminately.—*N. Y. Times*, 7/6.

BERLIN VERSION.—A German air squadron has dropped more than 5000 kilograms (11,000 pounds) of bombs on military establishments at Sheerness, England, German Army Headquarters announced June 6. Good hits were observed.

Reporting on the aviation activities of the western front forces, the official statement says:

One of our airplane squadrons dropped more than 5000 kilograms of bombs on military establishments at Sheerness, at the mouth of the Thames. Good hits were observed.

During the numerous aerial battles along the front the enemy lost 11 airplanes. Lieutenant Allmenroeder won his twenty-fifth and twenty-sixth victories, and Lieutenant Voss his thirty-third.

Sheerness is a fortified seaport and naval arsenal in the northwest corner of the island of Sheppey, in Kent, a vast dockyard being located there. It has a population of more than 18,000, according to the latest available figures.—*N. Y. Times*, 7/6.

ZEPPELIN RAID OF JUNE 17.—German airships made a raid on the east and southeast coasts of England early this (Sunday, June 7), morning. One Zeppelin was brought down in flames, according to the official announcement, after one of the raiders had dropped bombs in Kent. The official statement follows:

"Early this morning (June 17), some enemy airships approached the east and southeast coasts. About 2 a. m. two airships came a short distance inland, one crossing the East Anglian coast and the other coming over Kent for a few minutes. Bombs are reported to have been dropped from the latter ship. Some damage was done and fire broke out in a coast town. No further details are yet to hand.

"Later one Zeppelin was brought down in flames."—*Baltimore News*, 17/6.

SWEDISH DESTROYERS FIRE ON ZEPPELIN.—A Copenhagen despatch via London dated June 2 says:

A Zeppelin appeared over Swedish territory on Friday morning (June 1) near Malmo, and was driven away by the fire of Swedish torpedo boats. The airship also approached the Danish frontier south of Copenhagen. Troops guarding the coast fired a number of warning volleys, after which the Zeppelin disappeared in a southerly direction.—*The Evening Star*, 2/6.

GERMAN DESTROYER LOST.—The following *Associated Press* despatch dated London, June 5, appeared in the *N. Y. Herald*, June 6:

A German destroyer has been sunk and another damaged in a running fight between six German destroyers and Commodore Tyrwhitt's squadron the Admiralty announces.

The text of the Admiralty announcement reads:

"The Vice Admiral at Dover reports that the enemy naval base and workshops at Ostend were heavily bombarded in the early hours this morning (June 5). A large number of rounds were fired with good results. The enemy shore batteries returned our fire, but our bombarding forces suffered no damage.

"Commodore Tyrwhitt also reports that early this morning a force of light cruisers and destroyers under his command sighted six German destroyers and engaged them at long range in a running fight. One of the enemy destroyers, the *S-20*, was sunk by our gunfire and another severely damaged. Seven survivors from the *S-20* have been picked up and made prisoners. There were no casualties on our side."

According to the *Evening News* correspondent, when Commodore Tyrwhitt's squadron first sighted the Germans they were five miles distant. They apparently had put to sea in fear of bombardment from the air and the water. When they tried to regain port the British squadron divided into two lines. A British destroyer opened the engagement and her fire damaged the *S-20* almost immediately.

Then a British cruiser joined in the engagement. The *S-20* soon began to sink. A destroyer rescued seven survivors during the chase of the remaining five German destroyers. This continued until the Germans had reached the mined waters off the Belgian coast.

Berlin report:

The loss of the German destroyer *S-20* is admitted in an official statement issued by the War Office dealing with the attack on Ostend by British ships. The statement follows:

Enemy monitors shelled Ostend on the morning of the 5th, killing and wounding a great number of Belgian inhabitants and causing some material damage to houses. Strongly superior reconnoitering forces, attached to the advancing monitors, encountered two of our torpedo-boats which were on guard. After fierce fighting the *S-20* was sunk, firing to the last moment. A portion of the crew was rescued by us.

The enemy forces received several hits and retired before the fire of our coast batteries.—*N. Y. Times*, 7/6.

ZEEBRUGGE, OSTEND AND BRUGES RAIDED.—British airmen have repeated their attack on German bases on and near the Belgian coast. Several tons of bombs were dropped June 1 upon Zeebrugge, Ostend and Bruges. The airdrome at St. Denis Westrem also was attacked.

"An airplane attack was made upon the enemy airdrome at St. Denis Westrem yesterday morning (June 1)," says the official announcement of the raid, "and last night naval airplanes and seaplanes attacked the German bases at Zeebrugge, Ostend and Bruges, dropping several tons of explosives."—*Washington Post*, 3/6.

A London despatch to the *N. Y. Times*, dated June 8, says that:

"Photographic plates of the bombardment of Ostend, which have arrived here, show that the British bombardment Tuesday was the most successful yet accomplished, ensuring that Ostend will be crippled as a useful German base for weeks, if not permanently.

"There are several series of these Ostend plates in the photographic record room of the Admiralty building. The first group were taken before the bombardment and show the town in panoramic squares. A second group of plates shows Ostend after the bombardment.

"Using a magnifying glass, one is struck by a change in the appearance of the great lock gates, on which all the activity of the harbor depends. These gates, 100 feet long and 20 feet high, seem to have lost some of their rectilinear character overnight. The breaking down of the locks prevents the retention of water in the basin and the canals which feed it, incapacitating the entire port machinery. Equally effective in crippling the harbor is a hit on the operating machinery, jamming the locks so that ingress or egress is impossible until repairs are made.

"The plates taken the day before the bombardment show ships at anchor in the harbor or the inner basin. In the later plates some ships have disappeared and others are apparently half submerged. The long wharf looks like a caricature of its former self, and two or three buildings in the dockyards have suffered badly.

The pictures confirm the statement in the official communique that more than half the buildings in the factory section have been destroyed or badly damaged."

ALL SHIPPING REMOVED FROM OSTEND HARBOR.—An *Associated Press* despatch from London says:

An Admiralty official statement issued june 10 reads:

"The vice admiral at Dover reports that the latest reconnaissance of Ostend shows that all large shipping has been removed from that harbor. Two destroyers lately reported as being towed to Zeebrugge probably are those damaged during the bombardment, which have been removed from the basin. The harbor presents a deserted appearance."—*N. Y. Herald*, 11/6.

ZEPPELIN "L-43" DESTROYED.—Zeppelin *L-43* has been destroyed over the North Sea by naval forces, Andrew Bonar Law announced June 14 in the House of Commons.

The *L-43* was destroyed this morning (June 14). Soon after being attacked it burst into flames fore and aft and fell into the sea.

The Admiralty reports that no survivors of the Zeppelin were seen.—*N. Y. Herald*, 15/6.

LONDON RAIDED JUNE 13.—A London *Associated Press* despatch dated June 13 says in part:

In a swift and deadly raid on the city of London to-day (June 13) German airplanes took a heavy toll in killed and wounded.

The casualties as officially announced numbered 534, including 97 killed and 437 wounded. Fifty-five men met death and 223 men were wounded. Sixteen women and 26 children were killed and 122 women and 94 children were wounded.

British airplanes ascended immediately the signal was given that hostile machines were coming, but the Germans remained at a great height and

flew swiftly, and evidently the British fighters had difficulty in the pursuit, for the loss of only one German machine has been recorded. Others are reported to have been brought down, but there is no official confirmation of this. The anti-aircraft guns of London, seemingly were unable to reach the Germans.

According to a supplemental report given out officially in the afternoon, the first bombs were dropped on the eastern outskirts of London at about 11.30 a. m. Numerous bombs fell in rapid succession in various districts in the east end. One bomb fell in a railway station, hitting an incoming train. Seven persons were killed and 17 injured here. Another bomb fell on a school, killing 10 and injuring about 50 children. A number of warehouses were damaged and fires were caused. A few bombs also were dropped near North Foreland and opposite the banks of the Thames, four persons being injured.

"The raid over London lasted about 15 minutes. The raiders were engaged by guns of the East London Defences and a large number of airplanes of the Royal Flying Corps and Royal Naval Air Service were sent up as soon as the enemy was reported off the coast. Several engagements took place in the air, but the results at present are uncertain."

From the roof of the *Associated Press* office the airplanes could be distinctly seen at a height of at least 2 miles in the triangular formation, which is a familiar sight to anyone who has visited the western front. The trio were so high that they appeared like three shiny flakes of snow against the bright sky. The anti-aircraft gunners were doing fairly creditable work in this, their first battle practice in many months. The raiders apparently were a little too high for the guns, which, nevertheless, were very useful in forcing the enemy to keep at an altitude where it was impossible to locate any objectives.

The flaky smoke from 30 or 40 shrapnel bursts, sent in repeated salvos from a dozen or more guns, hung long minutes in the sky, outlining the three visitors in a frame of white puffs. It was plain to see that the bursts were too close to the visitors for their comfort, calling forth a frantic series of machine-gun signals from the squadron leader, directing his brood to retreat quickly.

The little squadron's route over London as viewed from below was like a great hairpin, a straight arrow flight into the city, then a wide curve and a straight arrow flight out again. The whole visit of this trio occupied less than five minutes, and no other raiders were visible from this observation point.

This is the fourth raid made by the Germans in the new series of aerial attacks on England in which airplanes have been substituted for Zeppelins, apparently on account of the success of the British in bringing down the dirigibles. As on previous occasions, the airplanes made the attack in daylight.—*Baltimore Sun*, 14/6.

BRITISH PATROL BOAT DESTROYS GERMAN SEAPLANES.—Under a London date line of June 11, the *N. Y. Times* of June 12 prints the following:

Two of five hostile seaplanes that were sighted by a drifter of the Dover patrol to-day (June 11) were destroyed by the British craft, it was officially announced to-night. The Admiralty statement announcing this incident says:

"The vice admiral at Dover reports that about 5 a. m. to-day (June 11) one of his Majesty's drifters, while on patrol duty, encountered a group of five enemy seaplanes, and engaged them. One machine was destroyed, the pilot being rescued by another enemy machine. This machine was in turn attacked by the drifter, and both pilots were taken prisoners, the machine being so badly damaged that it sank while being towed into the harbor.

"The remaining three enemy seaplanes made good their escape."

BRITISH ARMED MERCHANT CRUISER "AVENGER" SUNK.—The British armed merchant cruiser *Avenger* was torpedoed and sunk in the North Sea on June 13. All but one were saved.—*N. Y. Herald*, 16/6.

BALTIC

ACTIVITY IN BALTIC.—The following *Associated Press* despatch dated London, May 24, appeared in the *N. Y. Herald*, May 25:

Pronounced German naval activity in the Baltic on May 22 is reported in a despatch from Copenhagen. May 22 a violent cannonade, lasting throughout the night, was heard by persons living along the shore. Houses on southern Danish Islands shook from concussions.

ZEPPELINS ACTIVE IN GULF OF BOTHNIA.—German submarines and light war craft, together with Zeppelins, are continuing their activities in the Gulf of Bothnia. Hardly a day passes without one or more Scandinavian vessels being sunk. The Zeppelins scout regularly along the Swedish coast line, occasionally coming inside the territorial limits.

A Swedish naval patrol yesterday (June 12) drove away a Zeppelin to the eastward of Stockholm.

Recently the Swedish torpedo boat *Castor* rescued Denmark's largest sailing vessel, the *Per-Ugland*, from capture. The *Per-Ugland* was stopped by a German armed trawler. Just then a Swedish steamer bound for Finland appeared. The trawler towed the *Per-Ugland* some distance eastward, anchored her and then went after the Swedish vessel, putting a prize crew aboard the latter. The trawler then returned to the *Per-Ugland*.

The commander of the *Castor* observed that the Danish vessel had been towed just inside Swedish territorial waters. He headed toward her just as the Germans attached a tow line and fired a shot at them. The Germans protested, but the *Castor's* commander stood his ground and compelled the release of the *Per-Ugland*.—*N. Y. Herald*, 13/6.

ATLANTIC

MAY 26 BERLIN DECLARED NO U-BOATS OFF COAST OF UNITED STATES.—The *Associated Press* was informed May 26 by officials of the German Foreign Office that no German naval forces recently had been despatched across the Atlantic. A rumor that a Prussian submarine was at present in American waters was dismissed by the government officials as a "probable invention of early summer visitors to the Maine coast resorts who are endeavoring to deprive the familiar sea serpent of its prerogatives."—*N. Y. Herald*, 28/5.

U. S. SQUADRON OFF BRAZIL.—An *Associated Press* despatch from Rio de Janeiro dated June 4, says:

The Chamber of Deputies voted to-day on the motion of Deputy Maurice Lacerda to authorize the cabling of a message of congratulations to the Congress of the United States on the arrival of an American squadron.

Deputy Henrique Coelho Netto delivered an address of welcome to the American squadron. He proposed that as an unusual mark of honor to the free American people in their struggle in the defence of the right there be appointed a commission of 21 deputies to visit the squadron, and that the commission include distinguished representatives of the military.

Deputy Souza Silva objected to this proposal, suggesting that the representation of the Chamber be limited to its marine and war committees. It was decided to send the message of congratulations, leaving aside the nomination of a special commission.

The foregoing despatch from Rio is the first published information of the steps in the plan of relieving British and French cruisers in the

waters of the western hemisphere with American warships. For the present the Navy Department withholds further information or comment upon it.—*Washington Post*, 6/6.

BRAZIL OPENS HER PORTS TO ALLIES.—The action of Parliament authorizing the President to adopt measures for the safety of navigation and revoking the Brazilian decree of neutrality in the war for the benefit of the United States and the Entente nations is being followed by diplomatic exchanges with representatives of the Entente Powers, and practical results may be expected soon.

Warships of the Allies will be permitted to visit Brazilian ports without adhering to the time limits imposed by neutrality.

The Government of Bolivia, replying to the Brazilian note of June 3 announcing the revocation of Brazilian neutrality, expresses its complete sympathy with the attitude taken by the sister republic. The reply conveys the appreciation of Bolivia for the "happy interpretation which Brazil has given to the Monroe Doctrine in associating itself with the United States for the defense of neutral rights."

Bolivia severed relations with Germany on April 13.—*N. Y. Times*, 9/6.

GERMAN PROTEST TO BRAZIL.—It is reported that Germany has made a protest against the utilization of German merchant ships by Brazil.

After the cancellation last week of Brazil's decree of neutrality in the war between Germany and the United States Brazil seized German merchantmen in her ports and interned the crews. Forty-six German merchantmen took refuge in Brazilian ports early in the war.—*N. Y. Herald*, 6/6.

OUR SHIPS OFF THE FRENCH COAST.—The Ministry of Marine June 6 announced that American warships had anchored off the French coast. The announcement adds:

"The French Navy greets with joy on their arrival these new brothers in arms who, under the flag of the great American republic, have come to participate until final victory in the struggle against the common enemy."

A large American transport containing wheat for American troops which are to come later has crossed the Atlantic under the protection of an American warship, the *Matin* announces. The transport is now being unloaded at a French port, the newspaper says.

Preparations are being made for the reception of American troops, the newspaper says further. Several bases similar to those of the British Army have been organized. Camps have been laid out for infantry and artillery and aviation parks have been established for American aviators. None of the American officers are bringing their families.

The *Matin* says the arrival of the transport means that the provisioning of the army is well under way before the arrival of the troops and that accordingly the American forces will make no call on the French stock of food.—*N. Y. Herald*, 5/6.

The naval collier *Jupiter* has arrived in France, Secretary Daniels announced June 7, laden with wheat and other supplies. The *Jupiter* steamed from an American port without any intimation of her voyage having been given out in advance and is now at anchor in a French port.—*N. Y. Herald*, 8/6.

MEDITERRANEAN AND ADRIATIC

THE NAVAL SITUATION OF ITALY IN THE WAR.—Senator William Marconi in the course of an interview for the *New York Times*, said:

"Our naval situation in this war," resumed Senator Marconi, "is curiously like that of England with reference to the German fleet. Our

navy is stronger than that of Austria, but we cannot get at the enemy fleet. It is kept bottled up in the many harbors on the east shore of the Adriatic, where we cannot reach it because every harbor is heavily mined. That is the coast, a part of which at least must eventually belong to Italy, which once did belong to Italy before Austria took it away from us. We have no harbors on the west shore of the Adriatic. So far as this war is concerned, however, Austria might as well have no fleet. She dares to send out nothing but her submarines."

His allusion to the submarines, of course, recalled the recent rumors to the effect that Senator Marconi had devised something which would render the submarine useless.

"No," he replied regretfully, "we have not found the way to eliminate the submarine. We have made some useful discoveries in that direction, and we are working on them, but the submarine is like tuberculosis. You can fight it, you can lessen its ravages, but you cannot cure it altogether. The chances are still against the ship that comes within striking distance of the torpedo."

ENGAGEMENT IN ADRIATIC.—Early on the morning of May 15 an Austrian force consisting of light cruisers, which were subsequently reinforced by destroyers, raided the Allied drifter line in the Adriatic and sank the following 14 British drifters: *Admirable, Avondale, Coral Haven, Craignoon, Felicitas, Girl Gracie, Girl Rose, Helenora, Quarry Knowe, Selby, Serene, Taits, Transit,* and *Young Linnet,* from which, according to an Austrian official report, 72 prisoners were taken. H. M. S. *Dartmouth* (Captain A. P. Addison, R. N.), with an Italian rear admiral on board, and H. M. S. *Bristol,* assisted by French and Italian destroyers, chased the enemy off. Under heavy and continuous fire, the Austrian war vessels were chased until near Cattaro, when, some enemy battleships coming out in support of their cruisers, the Allied ships withdrew. Outside Cattaro the enemy warships were attacked by Italian airmen who reported that one enemy cruiser was on fire and in a sinking condition. Another enemy cruiser was reported by the admiral commanding the British Adriatic squadron to be "badly damaged." During her passage back the *Dartmouth* was struck by a torpedo from an enemy submarine, but was able to return to port. The casualties among officers and men of the *Dartmouth* were: Killed—officers, one; men, seven. Wounded—men, six. Slightly gassed as result of explosion—one man. There were no other casualties to our ships. The *Dartmouth* has a displacement of 5250 tons, and her principal measurements are: Length, 430 feet; beam, 48½ feet; and draft, 15½ feet. Her speed is 25.9 knots, and her armament eight 6-inch, four 3-pounder and four machine-guns. She was launched at Barrow in 1911.—*The Army and Navy Gazette,* 26/5.

AUSTRIAN VERSION OF ENGAGEMENT.—A British cruiser was sunk during an engagement with English, French and Italian vessels after an Austrian naval detachment had made a successful raid in the Strait of Otranto, on the southern coast of Italy, according to an official announcement made to-night (June 18) by the Admiralty. Italian destroyers, three merchantmen and 20 armed guard vessels, the statement adds, "became victims" of the Austrian raid.

A German submarine co-operated with the Austrian forces, which are said to have returned to port with small loss of life and little damage. The statement follows:

"On the night of May 14-15 a detachment of our light sea forces undertook a successful enterprise in the Otranto roads, in which Italian destroyers, three merchantmen and 20 armed guard vessels became victims. Seventy-two Englishmen of the crews of the guard vessels were captured.

"While returning our units had fierce engagements with superior enemy forces, in which the enemy, composed of English, French and Italian vessels, suffered considerable damage. On two enemy destroyers conflagrations were observed.

"Participation in the fight by enemy submarines and airmen was unsuccessful, while, on the other hand, our seaplanes participated splendidly in the fighting. They each obtained one hit on two enemy cruisers and effectively combatted hostile submarines. Our units returned in full number, with small human losses and damages.

"In brilliant co-operation with our naval forces a German submarine sunk with a torpedo an English cruiser with four funnels."—*N. Y. Herald*, 19/5.

BRITISH TRANSPORT "CAMERONIA" TORPEDOED.—It is officially reported that on April 15 the British transport *Cameronia* was torpedoed by an enemy submarine in the Eastern Mediterranean, and that the number of missing and presumed drowned is 140, including one military officer and 128 other ranks, and two officers and nine men of the crew. The *Cameronia* was a vessel of 10,960 tons gross, built at Glasgow in 1911.—*The Army and Navy Gazette*, 26/5.

JAPANESE DESTROYERS IN MEDITERRANEAN.—The arrival of "a considerable number of light Japanese naval craft in the Mediterranean to cooperate with the naval forces of the Allies" was announced in the House of Commons May 24 by Lord Robert Cecil, Minister of Blockade.

A Paris despatch May 18 said a number of Japanese gunboats had arrived at Marseilles to assist in the operations against German submarines and to convoy French merchantmen. If the experiment has satisfactory results it is to be extended.—*N. Y. Herald*, 25/5.

BRITISH TRANSPORT "TRANSYLVANIA" TORPEDOED WAS CONVOYED BY JAPANESE.—A Tokio despatch, dated May 26, says:

An announcement issued by the Admiralty May 26 says that the British troopship *Transylvania*, which was torpedoed in the Mediterranean on May 4, was being escorted by Japanese destroyers. The destroyers engaged the submarine.

According to the announcement, the Japanese rescued 2800 out of 3000 troops on the *Transylvania*, winning the praises of Japan's allies by their bravery.

The official British account of the *Transylvania's* sinking did not give the number of troops on board but said that 29 officers, 373 of other ranks, and 11 members of the crew lost their lives. Announcement was made in London on Thursday that light Japanese naval craft had arrived in the Mediterranean.—*N. Y. Times*, 27/5.

SAYS SPANISH VESSEL WAS U-BOAT SCREEN.—An *Associated Press* despatch dated Paris, May 26, states that the Chamber of Deputies continued to-day (May 26) its animated debate on the submarine question. Deputy Emmanuel Brousse delivered an interpellation concerning the measures which the Ministry of Marine proposes to take to assure safer navigation on the Mediterranean, particularly near the Spanish coast. He asserted that the routes of the regular steamship lines were not sufficiently patrolled, adding:

"Lately a French vessel and an American vessel were torpedoed 20 kilometers from Port Vendres. Three hours passed before the patrol boat was ready to leave Port Vendres, and by that time the submarine had escaped."

M. Brousse also asserted that the submarines obtained their supplies and oil in Spanish waters, and that the French transport *Medjerda* was torpedoed by a submarine which was screened behind a Spanish sailing vessel.—*N. Y. Herald*, 27/5.

BRITISH MONITORS SHELL AUSTRIANS.—Perceval Gibbon in a special cable to the *N. Y. Times* dated Grado, Gulf of Trieste, May 26, says:

"Dawn breaks early at this season. On Thursday last (May 24) it was already light before five o'clock, when English monitors wallowed out to their firing stations off these island-dotted lagoons and got into position for action. They were veterans of the Dardanelles and had been assigned long since to a part in the great battle which the Italian troops ashore upon the Carso were driving so effectually home.

"Their post was midway up the gulf, where their great guns could bear upon airplane hangars and multifarious military establishments which surrounded Prosecco and Contovello, twin villages upon the main road and railway to Trieste, both constituting important depots for Austrian air service and general supplies. The vessels were piloted to their stations, where their great guns commanded the targets.

"When the first gun spoke a great shell went hooting into the amethyst distance, and an Italian scouting hydroplane duly marked it down true and precise upon the railway line south of Prosecco. The second shot landed a little north of the first. Fortune and good shooting contrived that it should hit the railway again at a point where a Trieste-bound train was passing. The train vanished in ghastly ruin.

"Then other monitors arrived at their stations and the bombardment continued in tremendous measured rhythm. Each monitor fired for two hours. They smashed the hangars, flattened the railway station of Prosecco, destroyed the railway and viaduct, and produced a great fire near Contovello, whose peak of bright flame was visible from here.

"Austrian seaplanes attacked them viciously, but their supporting Italian aircraft fought them off, shooting down two machines, whose four occupants were rescued, though it proved impossible to save the machines under fire from the Austrian batteries of Punta Ronco and Punta Prete, south of Trieste. These captured officers related that they were first aware of the presence of the monitors through an agitated telephone summons from Trieste stating that 'the English and the Italian navies in the Gulf of Trieste are preparing to bombard the coast.'

"Motor craft which scouted the gulf ascertained the presence of two Austrian submarines which issued from Trieste just after the monitors left."—*N. Y. Times*, 24/5.

HOSPITAL SHIP "DOVER CASTLE" AND BRITISH DESTROYER SUNK.—The British hospital ship *Dover Castle* has been torpedoed and sunk, it is announced officially, and a British destroyer has been sunk after a collision. The text of the announcement reads:

"His Majesty's hospital ship *Dover Castle* was torpedoed without warning at 6.30 o'clock on Saturday in the Mediterranean. At 8.30 she was again torpedoed and subsequently sank. The whole number of hospital patients and the hospital staff were safely transferred to other ships and the crew were also saved with the exception of six men who are missing and are feared to have been killed by the explosion.

"His Majesty's armed mercantile cruiser, *Hilary*, Acting Captain F. W. Dean, has been torpedoed and sunk in the North Sea. Four men were killed by the explosion.

"One of His Majesty's torpedo-boat destroyers has been in collision and sunk. There were no casualties."

The *Dover Castle* was a vessel of 8271 tons and was 476 feet long.—*N. Y. Times*, 30/5.

U-BOAT TORPEDOED BY FRENCH SUBMARINE.—A Rome despatch dated June 1 says:

"The French submarine *Circe* has torpedoed and sunk a large enemy submarine as it was coming out from Cattaro, escorted by a torpedo-boat.

Although attacked by airplanes, the *Circe* returned undamaged to its base.—*Washington Post*, 3/6.

AUSTRIAN TORPEDO BOAT DESTROYED.—An *Associated Press* despatch dated Vienna, June 5, states that an Austrian torpedo-boat was torpedoed and sunk by a hostile submarine on Sunday night, June 3, in the Northern Adriatic, it was officially announced June 5.

The announcement reads:

"On Sunday night (June 3) in the Northern Adriatic an Austrian torpedo-boat was torpedoed and sunk by an enemy submarine. The majority of the crew was rescued."—*N. Y. Herald*, 6/6.

U. S. ARMED MERCHANTMAN "SILVER SHELL" ENGAGES U-BOAT.—The Navy Department June 9 let it be known that it was the American ship *Silver Shell* which recently engaged a German submarine.

The State Department issues the following:

"The Department of State is advised by telegraph of an engagement between an armed American steamer and a submarine. The guns of the steamer were manned by an American naval crew. The submarine was first seen at about 7000 yards. She had a 6-inch gun forward and another aft. She flew no flag. Upon sight of the submarine the steamer hoisted the American flag and waited for about 10 minutes. As the submarine approached the steamer fired. The submarine responded. The steamer kept a speed that would permit the submarine to come within range. Then followed a fight lasting for an hour and a half. The submarine came to a distance of about 2300 yards. By that time the submarine had fired 35 shots and the steamer 25. The last shot of the steamer apparently struck the submarine, which raised clear out of water and stood stern end up for a few seconds. Then she disappeared. The captain of the steamer and the commander of the guard believe that the submarine was sunk. The steamer suffered no damage."—*Official Bulletin*, 7/6.

TEN OF THE "SCORPION'S" CREW RETURNS.—Ten enlisted men of the United States Navy who were captured by Germans and held as prisoners for three days arrived June 7 as part of the armed crew of the American line steamship *St. Louis*. When they set foot on American soil they completed an eventful two months' trip from Constantinople, where they were in the crew aboard the converted naval yacht *Scorpion*, assigned to the American ambassador to Turkey.—*N. Y. Herald*, 8/6.

FRENCH TRANSPORT SUNK.—It is officially announced that the transport *Annam* was torpedoed in the Ionian Sea on June 11, while proceeding under escort. Bombs were at once thrown in the track of the submarine, which did not reappear. The *Annam* was taken in tow by one of the convoying ships, but sank in a few hours. There was no casualties.

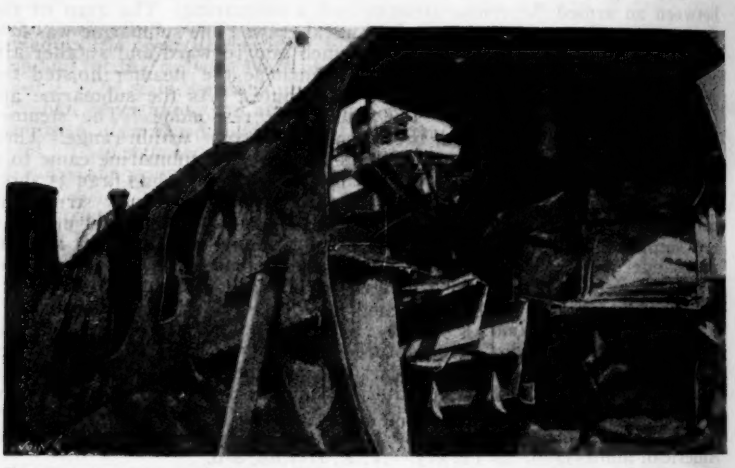
The *Annam* was a vessel of 6075 tons.

A semi-official note says that the German submarine *U-52*, which was towed into Cadiz on June 12, was operating outside that port. On June 12 a Norwegian steamer was torpedoed off Huelva and a Russian sailing vessel between Larache and Cadiz, which leads to the belief that a group of submarines has been sent to blockade the ports of Cadiz and Huelva.—*Washington Star*, 16/6.

SUBMARINES IN THE ADRIATIC.—Naval operations in the Adriatic so far have been confined for the most part to mosquito warfare. At the opening of the campaign there was a certain amount of cross-raiding, at which period the tactics favored by the Austrian fleet bore so close a resemblance to those of the Germans in the North Sea as to suggest the existence of a unified control over the combined naval forces of the Central Powers. At dawn on May 24, 1915, a few hours after Italy had declared war,

Austrian light cruisers and destroyers bombarded several defenceless towns on the Italian coast. According to the enemy's version, the battleship *Zrinyi* was present to support the lighter vessels, but with this single exception no larger Austrian warship has ventured out to sea. During the succeeding months other bombardments took place, after which they ceased, either because their futility was recognized, or in consequence of the increasing effectiveness of the Italian counter-measures. These included a prohibition of fishing in the Adriatic, a step which deprived the enemy of the valuable information he had formerly obtained through the agency of his spies, disguised as Italian fishermen. But if the Austrian battle fleet has remained wholly idle, its smaller craft have continued to show a good deal of activity, and it has been officially admitted at Vienna that Austrian submarines are mainly responsible for the maintenance of the "blockade" in the Mediterranean.

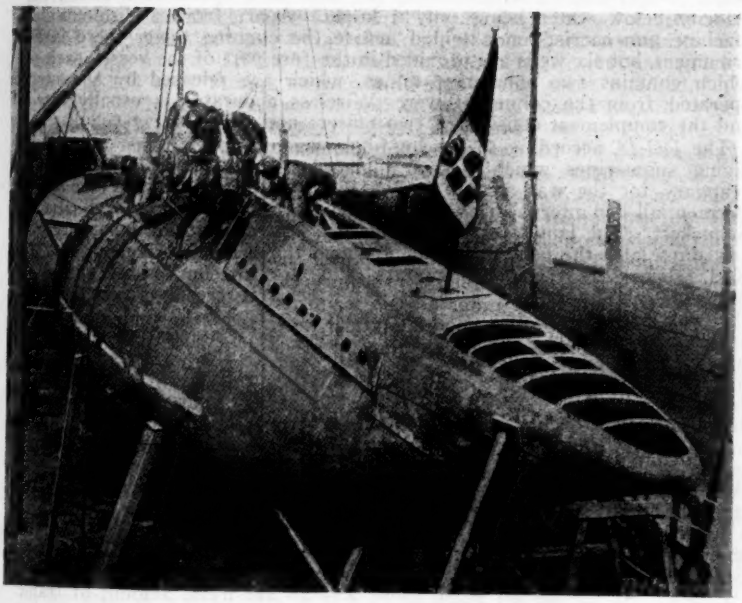
As there were only six Austrian submarines in service on the outbreak of war, it is evident that the flotilla must have been greatly augmented



GERMAN SUBMARINE "UC-12" AFTER HAVING BEEN RAISED BY THE ITALIAN NAVY

since. The six boats of which it was originally composed were all launched in 1908-1909, and differed but little in dimensions, although they represented three distinct types. The *U-1* and *U-2*, built at Pola Arsenal, were of the "Lake" type, displacing 270 tons when submerged, and having a speed of 12 knots above and 7.3 knots below water. They needed 2¼ minutes to submerge, and were able on trial to reach a depth of 150 feet. The *U-3* and *U-4*, built at the Germania Yard at Kiel, were slightly larger, and could submerge in 15 seconds. *Nos. 5* and *6* were "Holland" boats, constructed at the Whitehead works, Fiume, and were of the same tonnage and size as the first two. Six new submarines, with a displacement of 1000 tons, and a speed on the surface of 18 knots, were under construction for the Austrian Government at the Germania Yard, Kiel, but none had been delivered prior to August, 1914. Apparently, however, some of them managed to reach the Adriatic after the outbreak of war, for the *U-12* was officially admitted to have been torpedoed and sunk by an Italian submarine in August, 1915. An earlier boat, the *U-3*, was also sunk by the French destroyer *Bisson* in the same month. But in addition to the large boats which made their way by sea from German yards,

ANOTHER VIEW OF THE "UC-12"



"UC-12" REPAIRED BY THE ITALIAN NAVY

it was suspected that Germany was aiding her ally by despatching submarines of the coastal type overland to the Adriatic ports, where they were quickly reassembled and made ready for sea. The Italian Government has now published evidence which confirms this suspicion, and, at the same time, exposes the treacherous conduct of Germany in the period when the latter's relations with Italy were still nominally on a friendly footing. The publication* referred to deals, *inter alia*, with the capture of the *UC-12*, a German submarine minelayer. Documents recovered from this boat show her to have been a unit of the German Navy, manned by a purely German crew. They show, further, that she was engaged in active hostilities against Italy many months before that country declared war on Germany. This information is revealed by the log-book, which gives full particulars of her origin and subsequent movements. She was one of the group of small submarines designed by Germany for the special purpose of laying mines. There is reason to believe that a very considerable number of these boats has been built in the last two years. They are of modest dimensions, and the workmanship is extraordinarily crude, a fact that appears to suggest very rapid construction. To the same class belonged the *UC-5*, which was captured by a British destroyer in April last year, and afterwards placed on exhibition in London. Readers who inspected this prize may recall her rough, unfinished appearance, the slipshod riveting, and her general appearance of having been built in great haste by unskilful workmen. The design is evidently a standard one, judging from the close similarity between the *UC-5* and the *US-12*. On the surface they displace 190 tons, and 210 tons when submerged. The length is approximately 110 feet, and the maximum diameter 10 feet. For surface propulsion there is a four-cylinder 90 horsepower Diesel engine, which drives the boat at a speed of 6 knots, her velocity below water being only 4 knots. Apart from a dismountable machine gun carried on a tripod before the conning tower there is no armament, but six wells are provided in the fore part of the vessel, each of which contains two submarine mines, which are released by a control operated from the conning tower. Wireless apparatus is usually fitted, and the complement consists of two officers and 15 men.

The *UC-12*, according to her log-book, was one of the first two minelaying submarines which Germany placed at the disposal of Austria-Hungary for the war against Italy. She was built at the Weser yard, Bremen, all her internal fittings being stamped with the name of Siemens-Schuckert. The launch took place at the beginning of May, 1915, and a few days later the boat proceeded through the Kaiser Wilhelm Canal to Kiel, where she arrived on the 17th, and at once embarked a cargo of mines. A month later, *i. e.*, after Italy's declaration of war on Austria, she was dismantled, divided into four sections, and placed on a train, arriving at Pola on June 24 with her crew and commander. Here she was reassembled in four days, and again took to the water, intact as at first, and, as the Italian Government observes, "German in everything, from the imprint 'Kaiserliche Marine' on every chart to the German Imperial crown ornamenting the table service, and from the cap ribbons of the crew with the three letters B. A. K.—Bekleidungs-Abteilung, Kiel—to the numerous iron crosses found in her interior." On July 25 and August 15 she visited the neighborhood of an Italian naval base, and there laid two barriers of mines. In the following December she was at Cattaro, taking on board a cargo of rifles and ammunition, destined for the rebellious Arabs in Lybia. These were duly landed at Bardia, near Sollum, on the coast of Cyrenaica, after which she returned to the Adriatic. At the period when there was an abnormal amount of traffic between the two shores of the Adriatic in connection with the transport

* *Sommergibili*, by Commander Guido Milanesi. Published by the Ministry of Marine.

of the Serbian Army, its impedimenta and prisoners—an enterprise which, by the way, was carried out without the loss of a single ship—the *UC-12* was cruising off Durazzo, and distributing mines liberally in the roadstead. None of these, however, claimed a victim. After this vain attempt she paid another visit to Cattaro, and then lurked about for three days at the entrance to the Italian base where she had first put in an appearance. Here, it seems, she fouled one of her own mines or blundered into those which had been laid for the defence of the port. At all events, a dull explosion was heard, followed by an immense column of water, and the patrol vessels at once arrived to investigate the phenomenon. Divers who were sent down came upon the wreck of the submarine at a depth of nearly 100 feet. The explosion had blown her practically in two. The extremities were not much injured, but amidships the havoc was very great, as will be seen by the illustrations. The bodies of 14 of the crew were found. Fragments of uniforms were discovered, together with badges, cap ribbons, and other articles, which left no doubt as to the identity of the boat and her crew. A machine gun was also recovered practically intact. The cap ribbons bore such devices as "S. M. S. *Vulkan*," " S. M. S. *Streiter*," "S. M. Unterseeboot *VI*," "2 Minen-Abteilung," etc.

At first sight the wreckage seemed too complete to admit of salvage, but a closer survey convinced the Italian naval engineers that the reconstruction of the boat would offer no insuperable difficulties. The wreck was accordingly raised, in itself a task of no mean order, considering the great depth of the water, and placed on a slip for repair. The midship section, which had caught the full force of the explosion, had to be entirely rebuilt, while at the bow and stern new plates were fitted, the hydroplanes and rudders replaced, and the shafting repaired. It is to be presumed that the original propelling machinery was hopelessly damaged, but on this point there is no definite information. Throughout the work special care seems to have been taken to preserve the characteristic features of the design. What remained of the conning tower was skilfully repaired, and such fittings as were still serviceable were restored. The task was finally completed, and it will be readily conceded that the result, as depicted in our engravings, reflects great credit on all concerned in the work. The *UC-12* is now serving as a unit of the Italian Navy, though doubtless under a new name and one less suggestive of her Teutonic origin. It is interesting to note that, according to an official Rome communiqué of January 13th, another enemy submarine, the *U-12*, which was sunk, has since been salved and placed in commission. This appears to be one of the large German-built ocean-going submarines of 1000-tons displacement, which had been ordered by the Austrian Government in 1912, and were due to be delivered in 1915. So far as the smaller *UC-12* is concerned, the Italian naval authorities are to be congratulated on the highly successful completion of a piece of salvage and repair work which obviously called for no ordinary degree of patience and technical skill.—*The Engineer*, 11/5.

"U-52," DISABLED, TOWED INTO CADIZ.—The Spanish torpedo-boat *No. 6* this morning discovered the German submarine *U-52* disabled from gunshots which had struck her engines. The submarine was towed into Cadiz and stripped of her wireless apparatus so that the vessel could not communicate with vessels of the Central Powers interned in this port.

Repairs to the German submarine will take at least two days, but it is believed the vessel will be interned. The German commander called on the Spanish port officials, who later returned the call.

The submarine is of 450 tons and carries a crew of 20. It is equipped with two torpedo-tubes and two rapid-fire guns.—*N. Y. Herald*, 13/6.

A naval attaché of the German Embassy arrived at Cadiz June 13 and made and examination of the submarine *U-52*, which is tied up at the arsenal dock, says a Havas despatch from Cadiz. The vessel will remain in port a month for repairs.

The French press protests against Spain permitting the *U-52* asylum for repairs. The *Temps* points out that her sister submarine, the *U-53*, visited an American port last October and after a short stay went to sea and sank six vessels, the routes of which she had learned while in port.—*N. Y. Herald*, 14/6.

GIBRALTAR FIGHTS U-BOAT.—Investigation of the accidental firing of shells into Algeciras from Gibraltar, June 2, shows that it was not due to a mistake during target practice, as was reported at the time, but that the shots were fired at a submarine, which fled into the straits pursued by three cruisers. The submarine attempted to escape in the darkness by running close to the shore.

Gibraltar was notified of the approximate position of the submarine, and in attempting to reach it bombarded the city. Only slight damage was done.—*Washington Post*, 10/6.

JAPANESE DESTROYER DAMAGED.—While Japanese destroyers were attacking a submarine in the Mediterranean on June 11, the destroyer *Sakaki* was torpedoed and damaged, says an official announcement of the Japanese Admiralty June 16. The damaged craft was towed to port.

The Japanese naval attaché in London announces the loss of 55 lives aboard the *Sakaki*.—*N. Y. Herald*, 17/6.

BLACK SEA

RUSSIAN FORCES RAID BLACK SEA COAST.—A Russian squadron in a cruise along the Anatolian coast on May 29 bombarded four ports and destroyed 147 sailing ships loaded with supplies, says the official statement issued by the Russian War Department to-day (June 2).

The statement follows:

"Black Sea: During a cruise on May 29 near the Anatolian coast our ships destroyed munition depots and a factory in the region of Tschekirogly. They afterwards destroyed at Samsun a steam mill, a barracks and artillery depots. At Oveni they destroyed the barracks, a mill and a quay. At Ordeh (Ordu) our ships destroyed an observation post, the port and administration buildings, the headquarters of the enemy rear guard, the arm postoffice and barracks and various depots.

"Our ships also destroyed 147 sailing ships laden with supplies and brought back to Trebizond two schooners."—*Washington Post*, 3/6.

RED SEA

BRITISH MEN-OF-WAR CAPTURE FORT AT SALIFF.—Fort Saliff, on the east shore of the Red Sea, has been captured by British warships, it was officially announced June 14 in the following statement:

"The Commander in Chief in the East Indies reports that on Tuesday morning (June 12) His Majesty's ships, under his command, captured the fort at Saliff, after a resistance of three hours.

"The fort is situated on the eastern shore of the Red Sea, in the Kamaran anchorage, 180 miles north of Perim, between Loheiya and Hodeida.

"Ninety-four prisoners, three machine guns and two mountain guns, and military stores, camels and the harbor plant were captured. One British seaman was killed."

Fort Saliff is on Kamaran Bay, in Yemen Province, southwestern Arabia. Large rock salt works are located there. The captured fort lies about 175

miles north of the Gulf of Aden. A force of Turks to the north of Aden has been long in the way of the British in attempts they have made to advance from that city. The purpose of the seizure of Fort Saliff may be in facilitation of a movement to work in behind this force and capture or disperse it.—*N. Y. Herald*, 15/6.

PACIFIC

"CORMORAN'S" CREW ARRIVES IN THE UNITED STATES.—An *Associated Press* despatch from San Francisco, dated June 8, to the *N. Y. Times*, says:

Three hundred and twenty-two officers and men of the crew of the German cruiser *Cormoran*, which was sunk outside the harbor of Guam to prevent its seizure by the United States when war was declared, arrived as prisoners of war at a California port to-day. Fifty marines were in charge of the Germans.

GENERAL

COMMANDER EDWARD R. G. R. EVANS, R. N.—Commander Edward R. G. R. Evans, who was second in command of the Scott antarctic expedition and was in charge of the British destroyer *Broke* when she, with another British destroyer, defeated six German destroyers off Dover on the night of April 20, has been assigned to advisory duty with the American destroyer squadron in British waters. He went aboard the senior American officer's vessel as soon as the American destroyers arrived, and his duties began immediately. He will continue in touch with the senior officer, giving that officer practical advice on all matters concerning strategy, technique and the latest methods of submarine warfare.

The appointment of the commander of the *Broke* to duty with the American squadron was received with the greatest enthusiasm by the American forces, and his selection is regarded as one of the happiest events in connection with the reception of the American units.—*N. Y. Herald*, 19/5.

VICE ADMIRAL SIMS' REPORT.—Secretary of the Navy Daniels, May 29, made public portions of the report of Vice Admiral Sims on the arrival of American destroyers in the war zone, in which the American commander told of the report that Berlin newspapers printed the fact of the sailing of the flotilla four days before its arrival at a British port. The report as given out by Mr. Daniels states:

"An interesting feature in connection with the arrival of the destroyers is the report that their sailing appeared in Berlin newspaper about four days before their arrival, and also that a field of mines was planted immediately off the entrance of the port at which they arrived the day before the arrival took place. These were the first mines planted in that vicinity during the previous three months."

In giving out the extract Mr. Daniels said that the letter made no further reference to the matter and that the vice admiral "did not give any statement or speculation as to how Berlin obtains its information." The Secretary also made public the following additional extracts from Admiral Sims' letter:

"I am pleased to be able to report the excellent impression given by our officers, ships and crews under their command. Our ships made no demands of consequence upon the facilities offered here in spite of the length of their passage under adverse conditions.

"The commander, when questioned by the admiral as to when his vessels would be ready for duty, reported that he should be ready that night, as soon as the ships were refueled. This was apparently a considerable surprise to the Admiralty, who then gave them four days before taking up active work. The vessels themselves caused a great deal of complimentary comment and were found to be well equipped for their prospective duty.

"Speaking generally, the impression made by our officers and our ships has caused very favorable comment, both here and in the Admiralty."—*Washington Evening Star*, 30/5.

GERMANY'S NEW RULES ON HOSPITAL SHIPS.—The intention of the German Government to sink all Entente hospital ships in the entire "barred zone" with the exception of certain ships from Saloniki to Gibraltar is semi-officially announced in Berlin, according to a Reuter dispatch from Amsterdam. The German announcement was made in reference to British denials of the German allegations that the British misused hospital ships. It cited several instances which, it was asserted, proved the correctness of the German accusation. The semi-official announcement read in part:

"The German Government will in the future prevent all traffic by hospital ships in the entire barred zone and in the Mediterranean, including the road left open for Greece, and will regard hospital ships appearing therein as war vessels and attack them immediately."

Germany, the announcement adds, will allow the transport of the ill and wounded from Saloniki on Greek railways to Kalamata Harbor and thence on hospital ships to Gibraltar on the following conditions:

"Firstly, these hospital ships on the road left open to Greek shipping must proceed at a rate of speed previously reported to the German Government.

"Secondly, that the name of the vessel and the time of arrival or departure be communicated to the German Government six weeks in advance.

"Thirdly, that a representative of the neutral government representing Germany's interests in the particular country in question shall certify before the departure of the hospital ship that she carries only the ill, wounded, and nurses and no goods other than materials for treating them."—*N. Y. Times*, 27/5.

NAVAL BATTLE NEAR.—German newspapers are printing anniversary articles on the naval battle of the Skagerrak, the impression being generally expressed that a new battle between the British and German fleets is a possibility of the near future.

German naval writers for some time have been discussing the prospect that the British fleet once more would try conclusions with Admiral von Scheer's armada. Many of the writers have been governed by the prevalent German skepticism regarding the losses of British ships claimed by the German Admiralty but denied by the British, and without comment omit ships like the *Tiger*, the *Warspite* and the *Marlborough* from their calculations of British losses. The German Admiralty, although retaining the names of the *Tiger* and a battleship of the *Queen Elizabeth* class, namely the *Warspite*, on its table of losses, modestly brackets them with the comment, "Denied by British Admiralty."

The anniversary articles are also intended to arouse enthusiasm for the national submarine subscription in aid of families of German sailors lost in submarine warfare.

From an article in the *Vossische Zeitung*, of Berlin, it appears that Germany has reconciled herself to the loss of Kiao-chow, her former Chinese possession, and the South Sea Island colonies, which were captured by Japan. Commenting on rumors regarding difficulties between Japan and Russia, the newspaper declares Germany undoubtedly is ready to cede the lease of Kiao-chow, in direct negotiations with Japan, in return for payment of the millions spent in making it a German base in the East, and also is willing to discuss the future disposition of the South Sea colonies.—*N. Y. Herald*, 2/6.

DUTCH SHIPS BAR AMERICANS.—American passengers from Denmark are no longer permitted on board steamships passing through the Cattegat

and the Skagerrak from Copenhagen to Christiania. The reason for the restriction is that German destroyers now patrol the waters between the two ports, and the steamship lines desire to save the Americans from the possibility of being taken from the ships. All vessels in those waters are stopped and searched by the Germans.—*Shipping Illustrated,* 26/5.

ICE FLOES SAVE A SHIP.—An unsuccessful attempt by a German submarine to destroy an armed Russian steamship near Kola Inlet in the arctic on May 10, in which nine shots were fired by the submarine without a hit, and ice floes saved the vessel from torpedo attack, was related on the arrival of the steamship at an American port.

The Russian fired two shots at the U-boat, her captain said, but these also missed. The captain asserted the approach to Kola Inlet is strewn with mines and navigation has become very dangerous.—*Washington Post,* 30/5.

FREEDOM OF SEAS.—Professor Herton Delmer, who was attached to the Berlin University as professor of English many years before the outbreak of the war, has just arrived here (The Hague) from Germany with his family. The professor spent the first months of the war in the internment camp at Ruhleben, but was subsequently released and permitted to live in Berlin with his family, where they endured many hardships and privations, resulting in broken health.

"The spirit of the German people," said Professor Delmer to the representative of the *New York Times,* "is now kept up by hopes of results from the ruthless submarine warfare and the widespread belief that Great Britain is about to be forced to surrender, but otherwise the people realize that Germany is at the end of her tether.

"When America first entered the war the cue was that America was a decadent dollar nation, not to be feared for war, and that no further effectual help could be given to the Allies by her, as she had already helped all she could financially and materially. The more serious minded, however, regarded this as a mistake, and many considered that the government had played the fool where America was concerned. Men like Maximilian Harden outspokenly declare the policy which led to the break with the United States to have been exceedingly shortsighted. The nation feels it has been deceived in President Wilson, as it took him for a man who could be won by soft sawder. He is now the most hated man in Germany."

The professor attended the big annexationist meeting organized by Countzu Reventlow, and says that the people were not overenthusiastic. The meeting was, however, important, as it brought out the first clear definition of what Germans mean by freedom of the seas, although this part of the count's speech was never reported even in his own organ. Reventlow said:

"Before the war we had freedom of the seas in a certain sense. But what we mean by freedom of the seas is not a mere peace-time freedom for trade in all seas. What we need and must have is such degree of German naval power as shall guarantee its immediate superiority over possible enemies on the seas at the beginning of hostilities. That is why the Belgian coast is absolutely necessary to us. We must have the power and facilities immediately to bring our submarines and other naval forces to bear on our principal enemy."

Professor Delmer believes that all the navy party seek is the same sort of complete supremacy which the German Army enjoyed at the first part of the war.—*N. Y. Times,* 31/5.

LLOYD GEORGE ON SUBMARINE CAMPAIGN.—Lloyd George, on announcing in the house of commons to-day that more effective blows have been dealt against submarines in the last three weeks than during any corresponding period of the war, paid a tribute to the assistance rendered by the American navy, saying:

"We owe a very considerable debt of gratitude to the great American people for the effective assistance they have rendered and the craft they have placed at our disposal. Now that the American nation is in the war it is easier to make arrangements for the protection of our mercantile marine than it was before."

The premier's statement on submarine warfare was altogether the most satisfactory heard in England for many months.

"It is much more difficult," he said "for me to give a public answer on this than on any other topic. It is very difficult for me to give information without to a certain extent revealing things which we had better keep to ourselves. All I can say is that we are making substantial progress.

During the last three weeks or month we have dealt more effectively with submarines than during any corresponding period of the war. This is true of this week as well as the preceding weeks. There is no doubt the effect will be made manifest in a considerable reduction of our shipping losses.

"It is true we are not through the month of May, but if the ratio of losses during the last 25 days is not exceeded then the reduction upon April will be very considerable. Indeed, there does not seen to be any reason to anticipate any worse figures in the coming week. The arrangements made for dealing with submarines have been increasingly efficient."

The premier then made his reference to American assistance, which was loudly cheered.

Turning to the food supply the premier said:

"There is a distinct improvement in our food prospects as a result of the improvement in the submarine situation. It is very difficult, however, to give a favorable answer which would not be mischievous. If I were to say there is no danger of starvation of the people I would be saying 'What's the good of cutting up our grass land, and what's the good of rationing?'

"The people must not rush from one extreme to another. We must appeal to the common sense of the nation. I say after taking counsel with my advisers and after going into the figures very carefully, that if the nation economizes and is not guilty of waste, if those who have got lands favorable for the production of food make the best use of them, if the workmen turn out tractors to enable us to plow, if the army helps with the men available—if, in fact, we all behave like reasonable human beings who want to save their country from disaster, privation and distress—the submarine menace is not one that need cause us any fear that the war is going to be lost for that reason.

"I see that to-day the Germans are depending mainly on submarine warfare for success. All I can say is that if that is their main hope of success, it is doomed to disappointment. If every one does his duty patriotically, each in his own way to the common stock, then I say the submarine is not going to defeat us."—*Washington Post*, 25/5.

GERMANY STILL CONFIDENT U-BOATS WILL TRIUMPH.—The speech of Premier Lloyd George, in which he said German submarines were being combated successfully, and that England could not be starved by the submarine campaign, is characterized as "only empty words" in a semi-official German reply.

"Facts are lacking," says the reply, "because our navy has found little trace of the new methods, whereby, according to the views of the enemy, the submarine danger can be met. Hitherto all enemy experts have agreed that with the present means they are powerless against the serious dangers occasioned by submarines. A change in tactical methods cannot be achieved in a fortnight. We calmly await Lloyd George's prediction as to the future."

BRITAIN'S GRAIN SHIP LOSSES.—Great Britain's losses in cereal ships has been only 6 per cent, according to a statement made to the *Associated Press* June 1 by Kennedy Jones, Director of Food Economy. The Ministry

of Food, he added, had made allowances for the loss of 25 per cent of this kind of shipping.

Mr. Jones said it had been figured that if the stocks on hand ever got below five weeks' supply there would be local famine. The harvest would produce a 12 weeks' supply of cereals, he said, and this, added to what would be on hand, would mean 24 weeks' supply. These stocks, he thought, might be made to last longer by careful rationing of both human beings and animals and by conservation in other ways. The maximum time the supplies could last would be 34 weeks, he estimated, and this would leave 18 weeks of the year to be accounted for. The cereals for that period must come from the outside world.

When the Ministry of Food took account of stock at the last of March, Mr. Jones said, it appeared that Great Britain would reach harvest time with only three weeks' supply of cereals on hand. The outlook is now much brighter on account of the success of voluntary rationing and the great reduction in submarine losses, and it is indicated that there will be a supply for 12 weeks at the harvest time, provided the present rate of imports is continued until then.

Great Britain is now better off by supplies for two weeks than was the case a month ago. Mr. Jones said it was an encouraging fact that the loss had been only 6 per cent, whereas an allowance of 25 per cent loss on grain ships had been made, but said at the same time that it was possible there might be in June a recurrence of heavy shipping losses which would upset calculations.—*N. Y. Times*, 1/6.

PLANS TO SUPPLY ALLIES.—The broad principles which will govern America's economic participation in the war, subject to Congressional legislation, were agreed upon May 18 at the final general trade conference of the British Foreign Secretary, Mr. Balfour; Secretaries Lansing and Redfield, and British and American trade experts. Subcommittees, appointed at the first meeting soon after the British mission arrived submitted their reports, which were accepted in principle, and the few remaining questions were left to the committees to be worked out in practice on the basis of whatever legislation was finally passed by Congress.

In general terms it has been agreed that the United States shall devote its resources preferentially to the Allies. In devoting some of the scarce supplies and tonnage to neutral trade, those countries evincing a friendly disposition toward the common cause will be favored. All shipping, so far as possible, will be devoted to emergency transportation only in order to decrease the chances of destruction by submarines.

The United States has been asked, but has not yet decided to accept, membership on all the allied economic committees, now sitting in London, including the shipping, munitions, wheat, executive, and the more general Comité Internationale de Revitaillement. These committees oversee the distribution of the whole of the allied resources in the specific fields assigned to them.

Likewise, it has been suggested that a general allied committee be formed in this country to draw together all the needs of the allied committees in London and insure the most efficient purchase and transportation of all supplies. This matter has not been finally decided, and probably will not be until Congress has acted on other questions pending, but the proposal will probably be adopted.

The inroads of German submarines and the shortage of shipping have made it essential to safeguard every available ton, and as a result absolutely no surplus movement of tonnage overseas will be permitted if Congress gives the administration the necessary authority to co-operate with the Allies.

The British have presented for the Allies a complete statistical statement of the various needs in imports, and the problem has resolved itself for the present largely into one of figures. For instance, there is so

much tonnage available for the vital needs of the Allies, leaving a certain balance for less essential goods and a final balance for the neutrals.

The necessity of rationing the European neutrals, not only to prevent goods entering Germany, but also to conserve tonnage, has been emphasized in the conferences. The elaborate system built up by Great Britain in the last two and a half years will be closely followed in practice, but the adhesion of the United States to the Allies makes it possible to enforce it with a far greater degree of success.

It is understood that an arrangement has been agreed upon whereby the vital necessities of the smaller neutrals can be supplied without leaving a loophole for leakage to Germany.

The South American situation, while not fully discussed, is an important part of the major trade problem as a large amount of tonnage is devoted to trade there. The entry of the United States into the war gives the Allies control of all the coal resources available, so that South American trade must follow the Allied lines, if it is to receive the life-giving imports of coal. With Argentina, for instance, ships devoted to carrying wheat to England can be used on the return voyage to carry coal to Argentina.—*N. Y. Times*, 19/5.

MINE SWEEPING IN THE CHANNEL.—Sweeping the English channel for mines laid by German submarines is one of the most exciting and dangerous occupations of the war, according to the stories told by men participating in that work.

"Mine sweepers doubtless are the only vessels of the navy on which life belts are worn from the time of leaving port until the return," writes Jacques Marsillac, from aboard a mine sweeper on service in the channel.

"The task of a group of mine sweepers, composed of seven sloops formed in echelons, two by two, connected by steel cables, with the flagboat leading, is to clear a channel about half a mile wide and 50 miles long of the mines laid there by German submarines," he adds. "These underwater mine layers carry from 15 to 24 mines, according to the type, and they frequently lay them quite close together, so close, in fact, that it has become an axiom in the mine-hunting craft that where one is found another is sure to turn up.

"The wireless operator on the flagboat of the group, who has served on four mine sweepers that have been blown up in the service, had scarcely flashed to the boats of the group that a mine had been signaled when a black mass adrift appeared on the crest of the waves ahead of our boat. A second later it disappeared. We steered in its direction, every man on deck searching intently for its reappearance. The few minutes in which a sighted mine disappears are full of infinitely disagreeable tension on board a mine sweeper.

"And if we touch it?" Marsillac asked of the wireless operator.

"Then it is joss," he replied, meaning that it would be fatal.

"On this occasion the fates were friendly to us," wrote Marsillac, "for the mine reappeared 50 yards away and, for some reason that no one could explain, remained in sight until the gunners could get action upon it. Round, black, it shone like a seal's back, showing from time to time its four mortal needles, contact with which means destruction. The boat sheered off and the gunners, using a special rifle ball at about 200 yards under immense difficulties resulting from the rolling of the boat, fired 50 shots, without touching one of the fatal needles. They succeeded, however, in piercing the mine, which filled with water and sank to the bottom of the sea.

"The two leading sloops raised a half red flag, which means that they have found a mine. At once began a maneuver intended to cut the cable holding it; suddenly a steel cable that connects each couple of sloops and which is called the 'sweep' struck the mine. It must have come in contact with one of the deadly needles, and broke the vial of acid inside which

sets off the discharge, for an immense column of water shot straight into the air to a height of 100 yards, completely masking from each other the two sloops between which the explosion occurred. Then the sloops went on in search of other mines, and thus continues every day this dangerous and heroic work of clearing the path for merchant ships through the high seas."—*Washington Star*, 4/6.

URUGUAY.—A despatch from Montevideo, dated June 15, says:

At a secret session of the Senate, after hearing the Minister of Foreign Affairs, it was resolved to declare that if the American squadron comes to Montevideo it will be received as friends.

Although Uruguay decreed its neutrality in the war between the United States and Germany, she expressed sympathy with the action of the United States. Warships rated as belligerents would be permitted to remain in port only 24 hours and would be limited as to the supplies which they might take on.—*N. Y. Herald*, 16/6.

MAJOR GENERAL PERSHING.—It has been reported that Major General Pershing and staff have arrived in France.

The War Department has announced the personnel of the staff of General Pershing, commander of the American expeditionary force in Europe, as follows:

Personal Staff—Capts. Nelson E. Margetts, field artillery, and James M. Collins, cavalry, and 1st Lieut. Martin C. Shallenberger, infantry, aids-de-camp.

General Staff Corps—Maj. James C. Harbord, cavalry, chief of staff; Maj. John McA. Palmer and Dennis E. Nolan, general staff corps, assistants.

Adjutant General's Department—Col. Benjamin Alvord, adjutant; Maj. John L. Hines, assistant.

Inspector General's Department—Col. Andre W. Brewster, inspector; Maj. Fox Connor and Robert L. Clark, assistants.

Judge Advocate General's Department—Lieut. Col. Walter A. Bethel, judge advocate; Maj. H. A. Bayne, assistant.

Quartermaster Corps—Col. Daniel E. McCarthy, quartermaster; Lieuts. Col. David S. Stanley and Harry E. Wilkins and Majs. Charles E. Stanton and Samuel D. Rockenbach, assistants.

Medical Department—Col. Alfred E. Bradley, surgeon; Col. Merritts W. Ireland, Maj. George P. Peed and Capt. Henry Beeuwkes, assistants.

Corps of Engineers—Col. Harry Taylor, engineer, and Capts. Ernest Graves and Robert G. Alexander, assistants.

Ordnance Department—Lieut. Col. Clarence C. Williams, ordnance officer, and 1st Lieut. Oley Bonar, assistant.

Signal Corps—Col. Edgar Russell, signal officer; Capts. Parker Hitt and James B. Taylor, assistants, and Maj. Townsend F. Dodds, aviation officer.

Attached—Lieut. Col. Robert H. Dunlap, U. S. M. C.; Majs. John H. Parker, 24th Infantry; Logan Felond, U. S. M. C., and Robert Bacon, Quartermaster Corps; Capts. Arthur L. Conger, 26th Infantry; Hugh A. Drum, infantry; Raymond W. Briggs, Quartermaster Corps; Hilosh B. Hilgard, Quartermaster Corps; William O. Reed, cavalry; John S. Chambers, Quartermaster Corps; David H. Scott, 5th Cavalry; Gabe Filleul, Gustavo Porges, F. T. Hill, H. B. Moore and C. D. Liebman, Quartermaster Corps; 1st Lieuts. George S. Patton, Jr., 7th Cavalry; Richard B. Paddock, Birdseye Blakeman Lewis, R. M. Glaspey and W. F. Repp, Signal Corps, and 2d Lieuts. Orva F. Beezley and Edwin F. Ely, Quartermaster Corps.—*Washington Star*, 9/6.

DESTROYER "ROE" ON FIRE.—Fire aboard the United States torpedo-boat destroyer *Roe*, lying in dry dock at the New York Navy Yard, was fought for an hour on the night of May 12 by four companies of Brooklyn firemen after marines and bluejackets had tried vainly to extinguish the flames.

Reserves were called out to keep the people away from the high fence surrounding the yard.—*Army and Navy Register*, 19/5.

GERMANY DECIDES TO HOLD AMERICANS TAKEN BY "MOEWE."—Germany has notified the United States the she regards the 74 American merchant sailors brought in by the raider *Moewe* as prisoners of war, and that they will be treated as such.

To insure them adequate care in the prison camp, this government (United States) has arranged to supply the men with additional food and other necessities through Switzerland.—*N. Y. Times*, 12/6.

EXPERIENCES OF NAVAL AVIATORS.—A special correspondent of the *New York Times*, writing from London, says:

"As far as bombing operations are concerned, the navy-that-flies confines its attentions principally to the German bases along the Belgian coast, and any lurking submarines or vagrant destroyers observed in the vicinity. Bombing is carried out by both airplanes and seaplanes, and differs from other forms of war flying in that it is principally performed at night.

"The function of the bombing machines is to reach a given objective in as short a time as possible, without provoking more 'scraps' on the way than are inevitable, to 'deliver the goods' and, if not brought down by anti-aircraft fire, to return with all speed. They are not primarily fighters, and when laden with bombs are not theoretically a match for a hostile fighting machine with unfettered maneuvering powers.

"Engine trouble over enemy territory means almost infallible capture or death for the pilot of a bombing airplane. Yet in cases of disablement, rather than come down on the ground and suffer themselves or their machine to be taken prisoner, it is their gallant tradition to try to struggle out to sea. Here they stand about as much chance of life as a pheasant winged above a lake, but the machine sinks before German hands can touch it.

"Now, it happened that on one such occasion the descent into the sea of a bombing machine was observed by two French flying boats which were out on patrol. The distressed was still within range of the shore batteries and the boches, smarting under the effect of the bombs she had succeeded in dropping, were retaliating in the most approved Germanic manner by plastering the helpless machine with shrapnel as she slowly sank.

"*Rescue by a Flying Boat.*—The two French flying boats sped to the rescue and alighted in the water beside the wrecked British machine. One embarked the observer, who was wounded, and in spite of redoubled fire from the shore, succeeded in returning safely. The other French flying boat actually embarked the remaining occupants of the bombing machine, but was hit as it rose from the water and fell disabled.

"The French pilot, seeing a boche seaplane approaching and a bevy of small craft inshore coming out against them, scribbled a message to say that his venture had failed; he found time to add, however, with true Gallic dauntlessness of spirit 'Vive la France!' This missive he fastened to the leg of his carrier pigeon and succeeded in releasing it before rescuers and rescued were taken prisoners.

"From time to time curt official announcements of successful bomb raids upon German destroyer and submarine bases appear in the press. It may be that the naval honor or casualty lists are swelled thereby. But no one who has not stood in the wind that blows across the bombers' aerodrome at night in those last tense moments before the start, can form any idea of the conditions under which these grim laurels are earned.

"One by one the leather-clad pilots conclude their final survey and climb up into their machines. They adjust goggles and gloves; there is a warning 'Stand clear!' and the darkness fills with roaring sound as No. 1 starts his engine. For a few moments longer he sits in the utter isolation of darkness and the deafening noise of his own engine. No further sounds can reach

him; not another order nor valedictory 'Good luck' from those whose lot it is to only stand and wait. He settles himself comfortably and fingers the familiar levers and throttle; then, with a jerk the bomber starts along the unseen ground, gathers way, and, rising, speeds droning into the darkness like a gigantic cockchafer. A moment later No. 2 follows, then another, and another. The night swallows them and the sound of their engines dies away.

"*Returning from Flights.*—A couple of hours later in one of the gray painted huts that fringe the aerodrome a telephone bell jangles. The squadron commander picks up the receiver and holds converse with a tiny metallic voice that sounds very far away; the conversation ends, he puts on his cap and goes out into the darkness; a few minutes later a sudden row of lights across the aerodrome make bright pin-pricks in the darkness.

"From away in the air comes the hum of an engine growing momentarily louder. It grows clearer as the homing machine circles overhead, and finally comes to earth with a rushing wind and the scramble of men's feet invisible. The pilot climbs stiffly out of his seat, pushing up his goggles, and puckers his eyes in the light of the lanterns as he fumbles for his cigarette case.

"'Got 'em,' he says laconically. 'Seaplane sheds on the mole. Time for another trip?'

"There is time, it appears. He drinks hot coffee while the armorers snap a fresh supply of bombs into the holders and test the release gear. He answers questions curtly and his replies are very much to the point.

"Their 'Archies' are shooting well, and they've got a lot more searchlights at work than they had last time. Rather warm work while it lasted. He thinks No. 1 was hit and brought down in flames. No. 2 seemed to have engine trouble this side of our lines on the way back. No. 3 ought to be along soon.

"And while he gulps his coffee and grunts in monosyllables there is a whirring overhead and No. 3 returns, loudly demanding a fresh supply of bombs with which to put an artistic finish to a row of blazing oil tanks.

"They climb into their machines again and lean back resting while the finishing touches (which sometimes come between life and death) are put to the machines and their deadly freight. Then once more they soar up into the night.

"*Wounded and Taciturn.*—Dawn is breaking when No. 4 returns, tired-eyed and more monosyllabic than ever. It came off all right, but No. 3 had seemed to lose control and slid down the beam of a searchlight with shell and balls of red fire (some new stunt, he supposed) bursting all about her. However, she got her bombs off first and touched up something that sent a flame 200 feet into the air. He himself bombed a group of searchlights that were annoying him and some trucks in a railway siding. He has an ugly shrapnel wound in the thigh and observes with grave humor that his boots are full of blood—this is a navy joke, by the way. Also, that he could do with a drink. But it came off all right.

"Now the seaplanes, who undertake much the same sort of job, keep pigs and contemplate their stern mission with an unextinguishable and fathomless sense of humor. This may be accounted for by the fact that in life and death they are more in touch with the native element of the navy-that-floats and share much of its light-heartedness in consequence.

"Aerial gymnastics are not in their line. They fight when they must and the straightest shot wins. If hit, unless hopelessly out of control, they take to the water like wounded ducks. If the damage is beyond temporary repair they sit on the surface and pray for the dawn and a tow from a friendly destroyer.

No aerial adventure is ever recounted (and the array of D. S. C. ribbons around their mess table is witness of the quality of these blindfold flights) without its humorous aspect well-nigh obliterating all else. One who

fought a Zeppelin single-handed with a Webley Scott pistol and imprecations found himself immortalized only in the pages of a magazine of Puck-like humor they publish (fate and funds permitting) monthly.

"Another disabled on the water at the enemy's port, succeeded in getting his engines going as the crew of an armed trawler were leaning over the bows with boathooks to secure him. He rose from the water beneath their outstretched hands, and recalled with breathless merriment nothing but the astonishment of their Teutonic faces.

"*Escapes from a U-Boat.*—A third, similarly disabled, was approached on the surface by a German submarine. He raked her deck with his Lewis gun and kept her at bay by the simple expedient of picking off every head that appeared above her conning-tower until she wearied of the sport and withdrew. From a seaplane point of view is was a pretty jest.

The navy-that-flies is quickly building up its own peculiar and imperishable traditions. Not least of these is the seaplane's invincible gayety of spirit."

U. S. NAVAL AVIATORS IN FRANCE.—Simultaneous with the safe arrival of Major General Pershing and his staff in England, Secretary Daniels, June 8, announced the safe arrival in France of a corps of 100 naval aviators sent there for duty in the anti-submarine operations and for "any other active duty that may be given them in France."

Secretary Daniels said these were the first officers and men of the regular fighting forces of the United States that had landed in France. Lieutenant Commander Kenneth Whiting, U. S. Navy, is in command.—*N. Y. Times*, 9/6.

IN A GERMAN SUBMARINE.—From a Spanish source Reuter's agency has obtained the following account of the adventures of eight Spanish seamen on a German submarine and in a German prison camp. These eight men, who have been recently sent back to Barcelona, formed part of the crew of the British vessel *Gravina*, which was sunk February 7 last. The ship was struck amidships, and broke in two halves, and the 15 survivors were able to keep afloat by clinging to bales of corkwood.

"'In about half-an-hour's time,' states one of the Spaniards, 'we saw a submarine coming towards us. We shouted "We are Spaniards! We are Spaniards! Save us!" The submarine came near to us, and many of the crew were on its platform looking at us and laughing at our struggles. We expected to be picked up quickly, but no, we still had to remain in the water another 10 minutes while the submarine officers prepared their cameras to photograph us. Having done this, they proceeded to save us. They threw lifebelts attached to ropes, and got us on board. We had now been fighting against death for three-quarters of an hour. We were immediately made to go below through the after hatch to the part of the submarine used for discharging torpedoes and storing ammunition. In this floating prison we found two companions in misfortune—the captains of two English steamers sunk by the same submarine.

"'The monotonous but not tranquil life was disturbed from time to time by a rapid maneuver. Some vessel was in sight, and it was necessary to sink it. They forced us to load the torpedo, an operation which was performed with all the repugnance of honorable men. They opened the chamber of the tube, made us lift the torpedo and put it in. Afterwards they gave the order to fire, and, after a few seconds of anxiety we heard a formidable explosion. The German seamen jumped, laughed and sang. They had hit the target. During the 12 days that we were on board they sank five vessels, among them a Swedish sailing ship, which was sunk by cannon shots. On one of these occasion they called up the 15 survivors of the *Gravina*, excepting the captain and gunner, telling us to get ready, as they would put us in one of the boats of a vessel which they had just sunk. But when the 13 of us were ready an English destroyer was seen,

they countermanded the order, bells were rung, the Diesel engine stopped, dynamos hummed, and the pressure barometer in our chamber marked up to 50 meters of depth. We navigated thus for some hours, with a most agreeable atmosphere, with astonishing ease, but terribly cold air.

"'Generally speaking, we went down at night time, and although submerged we always navigated. In the day time we came up on to the surface of the sea, which, however, they never allowed us to see. We were aware of it by the change of motors. Our region of operation (that is, of the submarine) was for some days south of Ireland.

"'On February 15, 1917, we started on the homeward trip to the naval base, as the German seamen informed us. We went up the west side of England, round the north, and then to Jutland, always on the surface, and in three days arrived in the waters of Heligoland. One of us managed to see the engineer's diary, where the following particulars appeared: "18 miles speed on the surface and 13 miles submerged, 12,000 tons. Crew of 30," and in each page was noted *U-81*. Four hours before arriving at the island of Heligoland they made all the prisoners go up on the deck platform, and they photographed us. They then ordered us down below again to the torpedo-room. The port where we landed was not very large. There were about a dozen submarines and four or five destroyers there, but all the quays and jetties bristled with seamen with bayonets fixed.

"'The commander of the submarine, who was very young, asked who were the Spaniards and the Norwegian, making us pass to one side of the deck, the three captains and the remaining English, also the Roumanian engineer, staying on the other side. Four seamen accompanied them ashore, and four escorted us.'

"On April 14 the eight Spanish seamen were entrained for the Swiss frontier."—*Shipping Illustrated*, 16/6.

U-BOATS KEPT WELL INFORMED.—The British steamer *Southland*, from Liverpool for Philadelphia in ballast, was torpedoed without warning on June 4.

The gun crew on the *Southland* fired 10 shots at the submarine after the first torpedo was fired. A second torpedo was fired by the submarine, and it caused an explosion in the magazine which killed eight men.

As showing the excellent information which the submarines receive, the U-boat commander, when informed of the name of the ship, showed surprise and said, "Why, you are a week ahead of your time." The submarine flew no flag.—*N. Y. Times*, 9/6.

THE SUBMARINE SITUATION.—The following article by William Washburn Nutting appeared in *Collier's*, June 9:

This is not a pleasant article. I want to present the U-boat situation as it actually is. I want to show, by their results, the inadequacy of the means thus far employed to meet the submarine, and to say a word about our own preparations. I have seen something of Europe during the war, including Germany, Russia, the Baltic, and the North Sea; I have seen intimately what has been done in this country for our allies and for our own government, and I have talked with one who has seen the work of England, of France, and of Italy on the water as perhaps no other American has been permitted to see it. What follows is not idle speculation, but hard, disagreeable fact.

In the first place, the problem of the U-boat is, as I write, just as truly unsolved as it was in August, 1914. What is worse, it has become an infinitely greater problem, the solution of which grows hourly more imperative.

Here is one reason. An uncensored dispatch from England reports the sinking of 400,000 tons of shipping during a single week. That means the loss of the power to carry *400,000 tons of food, supplies, and all things sorely needed by our allies*—the power to carry this vast amount of freight

not once but many times. The vessels thus sent to the bottom in one week were 1.31 per cent of the entire British merchant marine.

At that rate, one might deduce, the existing merchant marine of Great Britain, upon which France and England depend if they are to go on fighting, would last a year and a half. But remember that this sinking of ships seems to be going on at no predeterminable rate. And if a stringency is now being felt in both France and England, how long can these countries wait for our still nebulous fleet of cargo carriers?

Every week it has been claimed that the peak of the U-boat activity has been reached. And almost every week has seen the total losses greater than those of the week before. *The peak has not been reached.* After making a thorough review of German shipbuilding facilities, Mr. Bernard Walker of the *Scientific American* estimates that it is possible that there are now under construction *over 500 boats of the U-53 type.* Mr. Walker further estimates that it takes six months to complete a standardized submarine, and we may bank on it that Germany has standardized her *Unterseeboot* to the very last rivet. The limiting factor would be the Diesel oil engines, but Germany is the home of the Diesel and is equally fortunate as to optical equipment and other details.

All of which may be said to promise a thousand submarines a year—and that's why the U-boat campaign progresses with an acceleration, and that's why the solution must come soon, or never.

In 1914 the submarine was a practically untried instrument, but it has undergone tremendous development in the laboratory of war. From the outset it has kept ahead of the means of fighting it. There is a popular belief in this country, which is dying a hard death, that swatting a submarine is a kind of outdoor sport to be indulged in by anyone who owns a motor boat. We picture the hardy Britisher, deprived of his grouse shooting, going out and bagging U-boats instead. Two years ago there may have been a measure of truth in this idea. At that time, except for its torpedo, the submarine was a comparatively harmless and helpless object, neither armed nor armored, not capable of extended running beneath the surface, and unable to cruise for more than a few days without returning to its base. In those days almost any vessel equipped with some sort of a shooting iron had a reasonable chance of success against the new craft, provided the submarine could be spotted. And even the spotting was not so difficult as it is to-day.

For the U-boat has evolved. It has grown a hard shell of 2-inch armor plate over its exposed parts and a stinger in the shape of a deck gun with which to welcome patrol boats. It has grown in size and speed till now it can cruise eight or 10 thousand miles before returning to its base. We Americans talk of the 800-ton *U-53* as if it represented the ultimate in development, and we feel that, though our submarines are few, we have at least taken a step ahead of Europe in our 1250-ton *Schley,* now under construction. I have reason to believe that even those in authority in the Navy Department held this view till recently. *And all the time the British, and possibly the Germans too, have been building submarines of 2000 tons displacement, capable of 24 knots on the surface and 16 knots submerged.*

With the British Patrol.—Now, in destructive power a 2000-ton submarine is not superior to a 1000-ton vessel except possibly for the greater size of its deck gun. The principal advantage is the greatly extended cruising radius and livability. Germany may have found it desirable, therefore, to stick to a standardized 800-ton model, especially as a greater number can be turned out in a given time. The one thing it is safe to say is that the German yards have subordinated every other consideration to the effort to turn out standardized U-boats.

This brings us to the remedy. There are just two methods of getting rid of hornets. One is to go about swatting the casual individual hornet; the other, the approved scientific method, is to place a torch on the end of a long stick and, possibly at some personal inconvenience, to burn out the

nest. We are told that getting at the nest is too great a risk for the British fleet to take. It would bring the fleet within range of the land batteries. We should, all the same, like to know whether our own fleet and the French fleet and the Italian fleet and the Russian fleet and the Japanese fleet—in part held in reserve, in part actively cooperating with the British—might not turn the trick. (Whether or not it would be wise to include capital ships in the party is a question that would be up to the naval commander. The Allied battle fleet would, of course, be augmented by a few hundred torpedoplanes and a thousand or so bomb-dropping seaplanes maintaining a sort of barrage.)

If this method must be passed up because the British Admiralty knows that it just can't be done, then we must continue swatting the individual U-boat, but we must have more swatters and we must develop a better method of swatting.

Furthermore, we must perfect a microphone or some other means of detecting submerged submarines—this is the crying need.

Early in the war England mobilized many of her destroyers and hundreds of her great fleet of North Sea fishing craft—trawlers and drifters—for this work, and to these were added a heterogeneous fleet of armed craft. But as the U-boat developed and carried its operations over an ever greater area, more patrol vessels were needed. And 1-pounders, 3-pounders, and even 6-pounders lost their vogue, for the later U-boats were mounting 4.7-inch guns.

Then England turned to America. America, through John P. Holland, had given to the world the most terrible of all war instruments, and now America was called upon to devise a means for its destruction. This means was the motor boat.

Fifty boats were ordered and then 500 more of practically the same type. They were 80-footers, built to carry 3-inch guns and good for 19 knots. Thanks to a degree of standardization never before dreamed of in connection with anything bigger than a Ford, every one of them was delivered at about the rate of a boat a day.

To-day, under the general head of "patrol boats," England has thousands of vessels, ranging from motor boats to naval auxiliaries, combing the Channel, the North Sea, and the waters round the British Isles. As an example of how the system works let us look at the 80-footers, the "ML's." They work in groups of six, one boat being the flagship, and frequently with a seaplane or a Blimp, which is held to be better than a plane for spotting submarines. Sometimes they work at the entrance to harbors on one-day shifts; at other times they may be called upon to maintain a station 150 miles off-shore for 10 days on end. These craft have been criticized by those who do not understand small boats, but they are everything that boats of their size and speed could be. Not one of the lot has been lost through stress of weather.

The armament of these little vessels is interesting. Each carries, besides its deck gun, a "depth charge," six "lance bombs," and a rifle for each of its 10 men. The deck gun is a 3-inch gun, modified for this purpose, and firing a shell that weighs about 13 pounds. The regulation 3-inch navy gun has a tremendous recoil pressure and requires a crew of seven men, but not so this modified gun. It is lighter and shorter, simpler to handle, and, while with its long recoil, it sacrifices extreme velocity, it is sufficiently powerful for the greatest ranges possible on a small, quick-acting vessel, and the ability to shoot such a husky shell is alone ample compensation.

The depth charge is a bomb containing 250 pounds of T.N.T., set to explode at any predetermined depth of water. This highly respected shipmate is dropped in the vicinity of a submerged submarine to blow in its side or disarrange its delicate interior economy.

Lancing the U-Boat.—The story of the lance bombs goes like this: A British destroyer was once placed in the embarrassing position of having a U-boat bob up right alongside. It was impossible to depress the guns

sufficiently to strafe the stranger, and there was nothing else to strafe him with. What happened to the destroyer I can't say, but it must have got away to tell the story, for each boat is now provided with lance bombs for just such emergencies. The lance bomb is a 14-pound contact bomb on the end of a 6-foot handle, the idea being to use it at close range by hurling it much as an athlete throws the hammer. These are implements loaded with awful possibilities in the hands of an amateur, and the surest road to unpopularity with one's shipmates is to suggest a lance-bomb rehearsal.

Thus far there has been no wholly satisfactory method of spotting and fighting the U-boat when submerged. Nets no longer stop them, for the later boats are provided not only with steel knives like the wire cutters of an armored car, but with shears, worked with an explosive charge. Bombs have been dropped from airplanes against submarines, and it should be comparatively simple to devise a bomb which, dropped from a height, would penetrate a considerable depth of water.

A great number of devices and methods for getting submerged U-boats have been tried. Anyone with an idea that sounds at all reasonable gets a tryout in England nowadays. One system already in use is particularly ingenious. A submerged contact bomb is towed from a bridle much like the bellyband of a kite, so that it stands well out to one side of the boat. Sometimes two are towed, one on each side. The U-boats are provided with cables from bow and stern to conning tower for the purpose of deflecting just such a device, but once you drag over one with your towing cable, the chances are pretty good that you will pull your bomb into contact with something substantial enough to explode it. Now, with all this elaborate preparation and the daily proof of the presence of hostile submarines, you would naturally think that the harvest would be large. It isn't.

Take Havre, where supplies and men are landed for the British force in France. Vessels are sunk almost daily a few miles off the harbor entrance, and the Germans are so methodical in their mine sowing that one can almost predict how many mines will be swept each day. Six is a good guess for Wednesdays. Vessels dare not leave the harbor by daylight, and there have been so many destroyers lost that vessels going out at night are seldom convoyed. Seaplanes are out from Havre continuously in the daytime, and yet, in spite of the almost daily toll of incoming vessels, instances where a German submarine has been sighted are few indeed.

SEAPLANES AND THE SUBMARINE BASES.—Zeebrugge, the great Prussian submarine base, is shown in the accompanying maps, with the depths of that section of the North Sea through which the U-boats must pass. It is proposed to send torpedoplanes to hover over Zeebrugge and destroy the submarines as they pass through the shallow water.

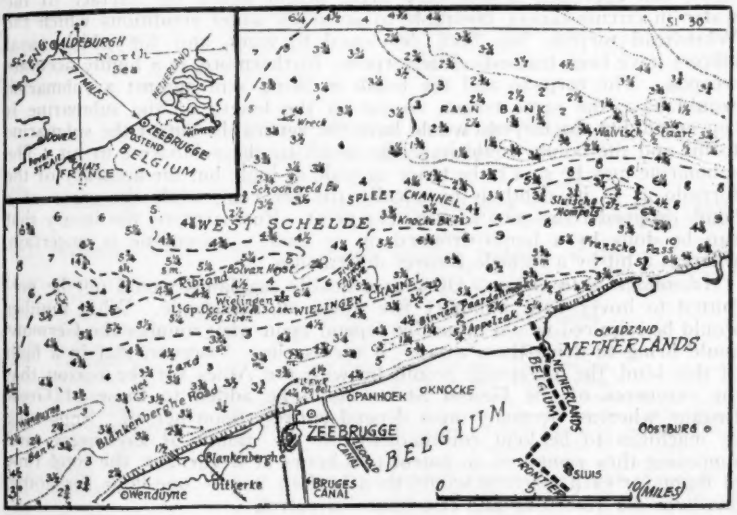
It will be remembered that the British ship *Gena* was sunk near Aldebrough, England, on May 1, 1917, by a torpedo discharged from a Prussian torpedoplane, in company with another. The torpedoplanes presumably had come from Germany or Belgium and therefore must have traversed a distance of at least 70 miles. The distance from Aldebrough shown on the map to Zeebrugge is 77 sea miles.

If a Prussian torpedoplane could go from Belgium or Germany to England and sink a vessel it seems reasonable to suppose that a British torpedoplane could go from England to Germany and sink a vessel.

Zeebrugge an Important Base.—This preamble has to do with the fact that one of the most important ports from which Prussian submarines issue is Zeebrugge, and that if the British can keep the submarines from coming out of Zeebrugge they can prevent any damage which the submarines might otherwise do. The same remark applies to any other port from which Prussian submarines issue. The two principal submarine ports seem to be Zeebrugge, in Belgium, and Cuxhaven, in Germany. We will confine our remarks for the present to Zeebrugge, which borders on water which is mostly less than five fathoms deep for a distance of nearly five miles.

Submarines draw at least 10 feet of water when running on the surface and require at least 30 feet, or five fathoms, in order that they may run submerged without being plainly seen, or without so disturbing the water as to leave a very clear wake easily visible from any aircraft. Therefore submarines can be attacked with the maximum chance of success while in shallow water, and by seaplanes, for which shallow water has no terrors. The little harbor of Zeebrugge is partly enclosed by a large stone breakwater, behind which the submarines lie. Many anti-aircraft guns are mounted nearby, so that attacks made from directly above can be resisted; in fact, several British seaplane attacks, made from directly over Zeebrugge, have been repelled before very great damage could be done.

Fliers Could Follow U-Boats.—That it would be easy to attack submarines after leaving Zeebrugge, but before getting into deep water, seems probable after a survey of the chart here presented. Suppose a large number of seaplanes were continually sent from England, 77 miles away, to



hover about five miles away from the harbor of Zeebrugge. Every submarine starting out from Zeebrugge could be instantly detected by the seaplanes, and then followed from a position such that it would be almost impossible for a gun mounted on shore to hit any of the seaplanes.

A seaplane presents a very small and dim target; besides that, it is of such a shape that it is difficult to find its range by a range finder, and it changes its height so quickly about the surface of the sea that it is almost impossible to tell how far off it is or to know whether any shot fired at it went over or fell short. Admitting, however, that occasional shots would hit a seaplane, or even bring it down, it seems reasonable to suppose that a large number of seaplanes could be kept circling in the air off the entrance to Zeebrugge all the time, both night and day. Supposing that to be the case, it would seem practically impossible for any submarine to get away from Zeebrugge and get into water deep enough to submerge herself.

It may occur to some that it would be impossible for seaplanes five miles away from Zeebrugge to see submarines coming out of Zeebrugge in the night time. That, of course, is true. But the seaplanes would not have to keep away five miles in the night time. They could move close into the

harbor mouth at nightfall and gain just as much benefit from the darkness as the submarines could.

Could Use Seaplanes Too.—It seems clear that for work of this kind against lightly built craft it would not be necessary to use torpedoplanes, but simply to use seaplanes dropping bombs. There can be no doubt that seaplanes dropping bombs would be very efficacious for work of this kind; in fact, that they have been very efficacious is well known. Bombs are considerably cheaper than torpedoes besides, and bomb dropping seaplanes can easily be used in connection with torpedoplanes. Torpedoplanes, however, would be much more accurate because in order to drop a bomb on a submarine the bomb dropping aeroplane must get vertically above the submarine and be exposed to the fire of the submarine's guns, unless the aeroplane rises to a height of at least 5000 feet, from which great distance the dropping of a bomb with accuracy from a moving aeroplane is a matter of very great uncertainty. The torpedoplane, on the other hand, can approach at not very great height above the surface of the water in circumstances favorable to accuracy under conditions which the Whitehead torpedo has been developed to meet, and for which naval officers have been trained. The torpedo, furthermore, is a highly accurate weapon. The torpedo and the bomb in being sent against a submarine would have the same target, so far as the length of the submarine is concerned, but the torpedo would have the vertical height of the submarine to hit and the bomb would have the width of the submarine to hit. The submarine may be said to be twice as wide as high, but the accuracy of the torpedo as to its depth is practically 100 per cent, while the error of a bomb dropped from 5000 feet is very great. Furthermore, the injury that can be done by a bomb dropped on or near a submarine is uncertain, whereas a hit by a torpedo insures destruction.

Advantage with Allies.—Of course hostile seaplanes would not be permitted to hover with impunity five miles off Zeebrugge. What number would be required would naturally depend upon what number the Germans could bring to drive them away. It seems clear, however, that in a fight of this kind, the advantage would lie with the Allies for the reason that the resources of the United States could be added to those of Great Britain, whereas Germany must depend entirely upon herself. Supposing 25 machines to be kept continuously off the mouth of Zeebrugge, and supposing they remained on patrol two hours at Zeebrugge, the total time of flight for each machine would then be four hours—one hour for going, one hour for returning and two hours of patrol.

Supposing 25 machines start at eight o'clock in the morning, they would arrive at Zeebrugge say at nine and start back at eleven. In order that they might start back at eleven the 25 machines that were to relieve them would have to start at ten. There would thus always be 25 machines going or coming, and 25 on patrol, making a total of 50 in flight, which would mean that there would have to be in England in reserve about 100. In other words, in order to keep 25 machines continually on patrol at Zeebrugge 150 machines would be required.

Mother Ships for Seaplanes.—That number of course could be greatly reduced, under conditions which made it practicable to start the seaplanes from mother ships in a position somewhere in the North Sea not far from Zeebrugge. If such a force were protected against Prussian battleships by say 50 torpedoplanes, equipped with modern torpedoes that can go six or more sea miles and sink a battleship, an effective blockade of Zeebrugge could, it would seem, be continuously maintained and the submarine menace, so far as Zeebrugge is concerned, be actually abolished.—*N. Y. Herald*, 4/6.

TABLE OF NAVAL LOSSES OF THE VARIOUS BELLIGERENTS SINCE THE OUTBREAK OF WAR

The following table is compiled from various articles appearing in the press of the several belligerent nations. These reports are so contradictory that it is impossible to furnish an absolutely correct list of vessels lost to date. In many cases the belligerent powers have failed to acknowledge the losses of all the vessels. No attempt has been made to include herein a list of the various trawlers, mine-sweepers and such odd small craft which may have been destroyed while mine-sweeping or on submarine patrol duty.

(On the left margin of this table of losses is a reference to the whole number in which an account of the loss is given. A page index of these losses is given in the whole number referred to.

ABBREVIATIONS FOR TYPE OF VESSEL

Dreadnought battleship	d. b.	Torpedo-boat	t. b.
Battleship	b.	Submarine	sm.
Battle cruiser	b. c.	Auxiliary cruiser	ax. c.
Armored cruiser	a. c.	Transport	tr.
Protected cruiser	p. c.	Minelayer	m. l.
Cruiser	c.	Coast guard	c. g.
Light cruiser	l. c.	Hospital ship	h. s.
Gunboat	g. b.	Training ship	tr. s.
Torpedo gunboat	t. g.	Patrol boat	p. b.
Monitor	m.	Armed merchant vessel	a. m. v.
River monitor	r. m.	Yacht	y.
Flotilla leader	f. l.	Naval tender	n. t.
Destroyer	d.		

LOSSES OF GREAT BRITAIN AND HER ALLIES

BRITISH WARSHIP LOSSES

WHOLE NUMBER	NAME	TYPE	TONNAGE	REMARKS	DATE
154, 155, 156	Audacious	d. b.	23,000	Reported sunk off Irish coast. Cause unknown. British Admiralty, non-committal	27-10-14
155	Bulwark	b.	15,000	Internal explosion at anchor in the Thames	26-11-14
156	Formidable	b.	15,000	Sunk by German sm., North Sea	1- 1-15
156	Irresistible	b.	15,000	Sunk in the Dardanelles	18- 3-15
156	Ocean	b.	12,950	Sunk in the Dardanelles	18- 3-15
161, 162	King Edward VII	b.	16,350	By mine, North Sea	9- 1-16
158	Goliath	b.	12,950	Torpedoed in Dardanelles	12- 5-15
158, 161	Triumph	b.	11,800	Sunk by sm., Dardanelles	25- 5-15
158	Majestic	b.	14,900	Sunk by sm., Dardanelles	27- 5-15
163, 164	Russel	b.	14,000	Sunk by mine, Mediterranean	26- 4-16
168	Cornwallis	b.	14,000	Sunk by German sm. in Mediterranean	9- 1-17
164	Queen Mary	b. c.	27,000	Sunk by gunfire, battle of Jutland	31- 5-16
164	Indefatigable	b. c.	18,750	Sunk by gunfire, battle of Jutland	31- 5-16
164	Invincible	b. c.	17,250	Sunk by gunfire, battle of Jutland	31- 5-16
161, 162	Natal	a. c.	13,550	Internal explosion and sunk at anchor	30-12-15
154	Hogue	a. c.	12,000	Sunk by German sm. U-29, North Sea	22- 9-14
154	Cressey	a. c.	12,000	Sunk by German sm. U-29, North Sea	22- 9-14
154	Aboukir	a. c.	12,000	Sunk by German sm. U-29, North Sea	22- 9-14
154, 155	Good Hope	a. c.	14,100	Sunk by German forces in Pacific	1-11-14
154, 155	Monmouth	a. c.	9,800	Sunk by German forces in Pacific	1-11-14
160	Argyll	a. c.	10,850	Ran aground, east coast of Scotland	28-10-15
164	Defense	a. c.	14,600	Sunk by gunfire, battle of Jutland	31- 5-16
164	Black Prince	a. c.	13,550	Sunk by gunfire, battle of Jutland	31- 5-16
153, 164	Warrior	a. c.	13,550	Sunk by gunfire, battle of Jutland	31- 5-16
164	Hampshire	a. c.	10,850	Sunk by mine, off Orkneys	6- 6-16
154	Hawke	l. c.	7,350	Sunk by German sm. U-9, North Sea	16-10-14
153, 155	Pathfinder	l. c.	2,940	Sunk by German sm., North Sea	5- 9-14
165	Falmouth	l. c.	5,250	Sunk by German sm., North Sea	19- 8-16
165	Nottingham	l. c.	5,440	Sunk by German sm., North Sea	19- 8-16
153	Amphion	l. c.	3,360	Sunk by mine, North Sea	6- 8-14
153	Pegasus	l. c.	2,135	Sunk by German c. Koenigsberg at Zanzibar	20- 9-14
162	Arethusa	l. c.	3,750	By mine off east coast of England	14- 2-16
155	Hermes	l. c.	5,600	Sunk by German sm. U-27, North Sea	31-10-14
163	Penelope	l. c.	3,600	Reported damaged beyond repair, attack on Lowestoft	25- 4-16
167	Newcastle	l. c.	4,800	Sunk by mine, Channel	15-11-16
153	Speedy	t. g.	810	Sunk by mine, North Sea	3- 9-14
154, 155	Niger	t. g.	810	Sunk by German sm. while at anchor	11-11-14
164	M-30	m.	——	Sunk by Turkish gunfire, Gulf of Smyrna	13- 5-16
164	Tipperary	f. l.	1,850	Sunk by gunfire, battle of Jutland	31- 5-16

BRITISH WARSHIP LOSSES—Continued.

WHOLE NUMBER	NAME	TYPE	TONNAGE	REMARKS	DATE
164	Turbulent	f. l.	1,850	Sunk by gunfire, battle of Jutland	31- 5-16
	Bullfinch	d.	370	Sunk in collision with Dutch merchant ship	18- 8-14
	——	d.	——	Ran ashore, Scotch coast	27-12-14
	Erne	d.	550	Wrecked in a storm	2-13
157, 158	Recruit	d.	385	Sunk by German sm., North Sea	1- 5-15
157, 158	Maori	d.	1,035	Blown up by mine off Belgian coast	7- 5-15
159	Lynx	d.	935	Sunk by mine	10- 8-15
161	Louis	d.	965	Wrecked, Eastern Mediterranean	10-11-15
162	Coquette	d.	365	Sunk by mine, North Sea	?- 3-16
164	Fortune	d.	920	Sunk by gunfire, battle of Jutland	31- 5-16
164	Sparrowhawk	d.	950	Sunk by gunfire, battle of Jutland	31- 5-16
164	Ardent	d.	950	Sunk by gunfire, battle of Jutland	31- 5-16
164	Shark	d.	950	Sunk by gunfire, battle of Jutland	31- 5-16
164	Eden	d.	555	Sunk after collision, English Channel	16- 6-16
164	Nomad	d.	1,200	Sunk by gunfire, battle of Jutland	31- 5-16
164	Nestor	d.	1,200	Sunk by gunfire, battle of Jutland	31- 5-16
165	Lassoo	d.	1,500	Sunk, mine or torpedo, North Sea	13- 8-16
	Medusa	d.	——	Left after collision. Found by Dutch trawler, towed towards Holland, sunk in Dutch waters	——
166	Flirt	d.	360	Sunk by gunfire of German d.	26-10-16
166	Nubian	d.	985	Torpedoed by German d. and ran aground	26-10-16
168	——	d.	——	Collision	21-12-16
168	——	d.	——	Collision	21-12-16
169	——	d.	——	Destroyed by mine	8- 2-17
169	——	d.	——	Damaged by torpedo from German d. and sunk by own crew	1-23-17
170	——	d.	——	Destroyed by mine	1- 3-17
158	No. 10	t. b.	244	Sunk by German sm., North Sea	10- 6-15
158	No. 12	t. b.	253	Sunk by German sm., North Sea	10- 6-15
160	No. 96	t. b.	130	Sank after collision with merchantman, Straits of Gibraltar	1-11-15
162	No. 11	t. b.	253	Sunk by mine, North Sea	2- 3-16
153	AE-1	sm.	725-810	Accidentally sunk off Australian coast	14- 9-14
154	E-3	sm.	725-810	Rammed and sunk by German vessel	18-10-14
154, 155	D-5	sm.	550-600	Sunk by German mine, North Sea	3-11-14
	D-2	sm.	550-600	Reported lost. Details not known	1-13-14
	E-10	sm.	725-810	Missing, North Sea	——
157	E-15	sm.	725-810	Ran aground in the Dardanelles and destroyed by own picket boats	18- 4-15
162	H-6	sm.	375-450	Stranded, Dutch coast, rescued and interned	20- 1-16
162	E-17	sm.	725-810	Reported as sunk off Holland	6- 1-16
159, 160	AE-2	sm.	725-810	Sunk, Sea of Marmora	30- 4-15
	E-13	sm.	725-810	Sunk by German torpedo craft off Danish coast	19- 8-15
160	E-7	sm.	725-810	Sunk at Dardanelles	4- 9-15
160, 161	E-20	sm.	——	Announced as sunk by Turks in Dardanelles	5-11-15
163	E-22	sm.	——	Sunk off Holland	25- 5-16
154	Oceanic	ax. c.	17,274	Ran aground off north coast of Scotland in storm	8- 9-14
162, 163	Alcantara	ax. c.	15,300	Sunk in battle, North Sea	29- 2-16
	Rohilla	ax. c.	7,400	Ran aground off Whitby, completely wrecked	30-10-14
156	Viknor	ax. c.	5,386	Lost off Irish coast	14- 1-15
	Clan Macnaughton	ax. c.	4,985	Lost in a gale	3- 2-15
157	Bayano	ax. c.	5,948	Probably torpedoed by German sm. in Irish Sea	12- 3-15
159	Ramsey	ax. c.	——	Sunk by German ax. c. Meteor, North Sea	8- 8-15
159	India	ax. c.	7,900	Sunk by German sm., North Sea	10- 8-15
169	Laurentic	ax. c.	14,900	Destroyed by mine	31- 1-17
165	Duke of Albany	a. m. v.	1,977	Sunk by German sm., North Sea	24- 8-16
159	Royal Edward	tr.	11,117	Sunk by sm., Ægean Sea	14- 8-15
160	Marquette	tr.	7,057	Sunk by German sm., Ægean Sea	26-10-15
160	Ramazan	tr.	3,477	Sunk by German sm., Ægean Sea	17- 9-15
161	Woodfield	tr.	3,584	Sunk off coast of Morocco	30-11-15
166	Franconia	tr.	18,000	Torpedoed by German sm.	4-10-16
168	Russian	tr.	——	Sunk by German sm. in Mediterranean.	11-12-16
168	Ivernia	tr.	14,000	Sunk by German sm. in Mediterranean.	1- 1-17
168	Ben-my-Chree	n. t.	——	Sunk by gunfire, Kastelorizo Harbor, Asia Minor	11- 1-17

BRITISH WARSHIP LOSSES—Continued

WHOLE NUMBER	NAME	TYPE	TONNAGE	REMARKS	DATE
	Hythe	aux.	201	Collision, Ægean	29-10-15
158	Princess Irene	m. l.		Internal explosion off Sheerness	27- 5-15
163	Medusa	m. l.	2,800	Collision	- 3-16
161	Abbas	c. g.	298	Sunk by German sm. off Sollum Harbor, Egypt	6-11-15
161	Abdel Monaym	c. g.	598	Sunk by German sm. off Sollum Harbor.	6-11-15
161	Anglia	h. s.	1,862	Sunk by mine, English Channel	17-11-15
107	Brittanic	h. s.		Mine or sm. in Ægean Sea	22-11-16
	Fishguard II	tr. s.		Foundered in gale, North Sea	17- 9-14
160, 161	Tara	p. b.	6,322	Sunk by German sm., Mediterranean	5-11-15
161	Aries	y.			15
161	Irene	y.			15
171	——	d.		Sunk by torpedo, North Sea	18- 3-17
171	——	d.		By mine, Straits of Dover	27- 3-17
171	——	d.		Collision	27- 3-17
171	Asturias	h.		Torpedoed	20- 3-17
172	——	d.		By mine, Channel	2- 5-17
172	Donegal	h.		Torpedoed	4-17-17
172	Lanfranc	h.		Torpedoed	4-17-17
172	Gloucester Castle	h.		Torpedoed	30- 3-17
173	Avenger	ax. c.		Torpedoed, North Sea	13- 6-17
173	——	d.		Collision	29- 5-17
173	Cameronia	tr.	10,960	Torpedoed, Mediterranean	15- 4-17
173	Transylvania	tr.		Torpedoed, Mediterranean	4- 5-17
173	Dover Castle	h.		Torpedoed, Mediterranean	26- 5-17
173	Hilary	ax. c.		Torpedoed, North Sea	- 5-17

FRENCH WARSHIP LOSSES

156	Bouvet	b.	12,007	Sunk at the Dardanelles	18- 3-15
167, 168	Suffren	b.	12,750	Sunk by German sm. off Lisbon	26-11-16
157	Leon Gambetta	a. c.	12,352	Torpedoed by Austrian sm., Straits of Otranto	26- 4-15
168	Gaulois	a. c.	11,260	Sunk by German sm. in Mediterranean.	27-12-16
162	Amiral Charnier	c.	4,702	Torpedoed, Mediterranean	8- 2-16
156	Mousquet	d.	298	Sunk by Emden at Penang	28-10-14
156	Dague	d.	720	Sunk by Austrian mine off Antivari	24- 2-15
	Branlebas	d.	330	Sunk by mine	— — —
162	Renaudin	d.	756	Torpedoed, Adriatic	18- 3-16
164	Fourche	d.	845	Sunk by Austrian sm., St. of Otranto	26?-6-16
164	Fantassin	d.	453	Sunk incident to collision	- 6-16
170	Cassini	d.	——	Sunk by German sm. in Mediterranean.	28- 2-17
	Zelée	g. b.	636	Sunk by German cruisers at Tahiti	28-10-14
167	Surprise	g. b.	636	Sunk by sm. gunfire at Funchal	-12-16
	No. 347	t. b.	97	Sunk in collision with each other	9-10-14
	No. 338	t. b.	97		
	——	t. b.	——	Reported lost	- 1-15
	No. 331	t. b.	97	Sunk in collision off Cherbourg	16- 6-15
	No. 219	t. b.	87	Sunk off Nieuport	- 1-15
155	Curie	sm.	398-550	Sunk by Austrians at Pola	23-12-14
156	Saphir	sm.	386-450	Sunk at the Dardanelles	17- 1-15
	Joule	sm.	398-550	Mined, Dardanelles	1- 5-15
	Calypso	sm.	345-490	Rammed and sunk during maneuvers off Cape Lardier	8- 7-15
161	Monge	sm.	392-550	Sunk by Austrians, Adriatic	28-12-15
159	Mariotte	sm.	522-615	Sunk at the Dardanelles	26- 7-15
160	Turquoise	sm.	386-450	Injured by gunfire, Sea of Marmora. Refloated by Turks and renamed Ahmed	3-11-15
161	Fresnel	sm.	398-550	Sunk in the Adriatic by an Austrian ship	5-12-15
166	Faucault	sm.	390	Destroyed by Austrian seaplanes	- 9-16
162	Provence	ax. c.	18,400	Torpedoed, Mediterranean	26- 2-16
	Indien	ax. c.	800	Sunk by sm. off Rhodes	8- 9-15
	Calvados	tr.	6,008	Sm., Mediterranean	3- 6-15
167	Karnak	tr.	6,800	German sm., Mediterranean	27-11-16
166	Gallia	tr.	15,000	Sunk by sm	4-10-16
168	Magellan	tr.	6,000	Sunk by German sm. in Mediterranean.	11-12-16
169	Amiral Magon	tr.	——	Sunk by German sm. in Mediterranean.	25- 1-17
158, 159	Casa Bianca	m. l.	945	Sunk in the Ægean Sea by a mine	4- 6-15
171	Danton	d. b.	18,400	Torpedoed, Mediterranean	19- 3-17
171	Cassini	d.	——	Torpedoed, Mediterranean	28- 2-17
172	——	t. b.	——	By gunfire, North Sea	25- 4-17
173	Boutefen	d.	703	By mine, North Sea	20- 5-17

RUSSIAN WARSHIP LOSSES

WHOLE NUMBER	NAME	TYPE	TONNAGE	REMARKS	DATE
166, 167	Imperatrista Maria	d. b.	22,500	Sunk by mine or internal explosion	20-10-16
165	Peresviet	b.	12,764	Wrecked near Vladivostock	7-16
	Pallada	a. c.	7,775	Sunk by German sm., Baltic	11-10-14
155, 156	Jemtchug	c.	3,130	Sunk by Emden, Penang	28-10-14
	Kubanez	g. b.	1,280	Reported by Turks sunk by Turkish d.	28-10-14
159	Sivutch	g. b.	875	Sunk by Germans, Baltic Sea	20- 8-15
162	Leit Pushtscheen	t. b.	350	Sunk by German sm. near Varna	10- 3-16
	Putschino	t. b.	——	By gunfire	30-10-14
155	Prut	ax. c.	5,440	Scuttled to avoid capture	29-10-14
	Riasan	tr.	3,522	Captured by Emden	6- 8-14
158	Yenisei	m. l.	2,926	Sunk by German sm., Baltic	6- 6-15
	Oleg	m. l.	1,125	Sunk, Black Sea	24-12-14
	Athos	m. l.	1,743	Sunk, Black Sea	24-12-14
163	Portugal	h. s.	——	Torpedoed by German sm	30- 3-16

JAPANESE WARSHIP LOSSES

168	Tsukuba	a. c.	13,750	Internal explosion	13- 1-17
	Shirotaye	d.	380	Ran ashore, Tsing Tao	4- 9-14
	No. 33	t. b.	82	Sunk by mines while mine-sweeping off Tsing Tao	11-11-14
	Name unknown	t. b.	——	By mine	
167	No. 4	sm.	125	Internal explosion	11-16
154	Takachiho	p. c.	3,700	Torpedoed by German d., S-90, off Tsing Tao	17-10-14

In addition to the above, five special service ships were sunk during the operations off Tsing Tao.

ITALIAN WARSHIP LOSSES

165	Leonardo da Vinci	d. b.	22,340	Caught fire and blew up, Taranto harbor	8-16
160	Benedetto Brin	b.	13,215	Sunk by internal explosion	28- 9-15
169	Regina Margherita	b.	13,214	Sunk by mine	11-12-16
158	Amalfi	a. c.	9,958	Sunk by Austrian sm., Adriatic	7- 7-15
158	Garibaldi	a. c.	7,234	Torpedoed off Ragusa, Austrian sm.	18- 7-15
158	Turbine	d.	325	Scuttled to avoid capture after engagement with Austrian vessels, Adriatic	24- 5-15
164	Citta di Messina	ax. c.	3,495	Sunk by Austrian sm., St. of Otranto	26?-6-16
161	Intrepido	d.	680	Sunk by mine, Adriatic	17-12-15
165	Impetuoso	d.	650	Sunk, Austrian sm., Otranto Straits	10- 7-16
168	——	d.	——	Sunk off Corfu	12-16
	5-PN	t. b.	118	Torpedoed by Austrian sm. off Venice	26- 6-15
	17-OS	t. b.	118	Sunk by own mine while mine-laying off Salvore	7-15
158	Medusa	sm.	241-295	Torpedoed and sunk, Austrian sm.	17- 6-15
	Nereide	sm.	221-315	Sunk by Austrian sm., Adriatic	5- 8-15
165	Giacinto Pullino	sm.	400	Captured by Austria	8-16
165	——	sm.	——	Reported missing	8-16
161	Re Umberto	tr.	——	Sunk by mine, Adriatic	17-12-15
170	Minas	tr.	2,854	Sunk by German sm. in Mediterranean	16- 2-17

LOSSES OF GERMANY AND HER ALLIES

GERMAN WARSHIP LOSSES

164	Pommern	b.	13,040	Sunk by gunfire, battle of Jutland	31- 5-16
164	Lutzow	b. c.	28,000	Sunk by gunfire, battle of Jutland	1- 6-16
155	Yorck	a. c.	9,350	Sunk by German mine near Wilhelmshaven	3-11-14
155, 156, 158	Scharnhorst	a. c.	11,420	Sunk by English forces off Falklands	8-12-14
155, 156, 158	Gneisenau	a. c.	11,420	Sunk by English forces off Falklands	8-12-14
155	Friederich Karl	a. c.	8,858	No official report. Press reports that she was lost in the Baltic	12-14
156, 163	Bluecher	a. c.	15,550	Sunk by British forces off Doggerbank	24- 1-15
160	Prinz Adalbert	a. c.	8,858	Sunk by British sm. in Baltic	23-10-15
153, 154	Mainz	p. c.	4,280	Sunk by British forces, North Sea	28- 8-14
153, 154	Koeln	p. c.	4,280	Sunk by British forces, North Sea	28- 8-14
153, 154	Ariadne	p. c.	2,618	Sunk by British forces, North Sea	28- 8-14
154, 155	Hela	p. c.	2,003	Sunk by British sm. E-9, North Sea	13- 9-14
153	Augsburg	p. c.	4,280	By gunfire	7- 8-14
154, 155, 156, 163, 164	Emden	p. c.	3,592	Sunk by Australian c. Sydney, Indian Ocean	9-11-14
154, 155, 156, 160	Leipzig	p. c.	3,200	Sunk by English forces off Falklands	8-12-14
155, 156, 158	Nurnberg	p. c.	3,396	Sunk by English forces off Falklands	8-12-14
158	Dresden	p. c.	3,592	Sunk by British cruisers in Pacific	14- 3-15
155, 156, 158, 162	Koenigsberg	p. c.	3,340	Sunk by English forces in Rufiji River	11- 7-15

GERMAN WARSHIP LOSSES—Continued

WHOLE NUMBER	NAME	TYPE	TONNAGE	REMARKS	DATE
161	Bremen	p. c.	3,300	Sunk by sm. in the Baltic	17-12-15
159	—— (two)	l. c.	——	Gulf of Riga	17- 8-15
153	Magdeburg	l. c.	4,478	Ran ashore in fog in Baltic; blown up by own crew after engagement with Russians	27- 8-14
155	Geier	l. c.	1,630	Interned in Honolulu	8-11-14
160, 161	Undine	l. c.	2,672	Sunk by British sm. in the Baltic	7-11-15
162	Karlsruhe	l. c.	4,822	Press reports state she was blown up by internal explosion while cruising in the Atlantic	4-11-14
164	Elbing	l. c.	5,000	Sunk by gunfire, battle of Jutland	1- 6-16
164	Weisbaden	l. c.	5,000	Sunk by gunfire, battle of Jutland	1- 6-16
164	Rostock	l. c.	4,820	Sunk by gunfire, battle of Jutland	1- 6-16
164	Frauenlob	l. c.	2,650	Sunk by gunfire, battle of Jutland	1- 6-16
	Moewe	g. b.	640	Sunk by her own crew at Dar-es-Salam when English vessels appeared	14- 8-14
	Wissman	g. b.	about 300	Captured by English on Lake Nyasa	20- 8-14
	Planet	g. b.	640	Sunk by her own crew at Yap Island on approach of Japanese fleet	7-10-14
155	Cormoran	g. b.	1,604	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies.	6-11-14
155	Iltis	g. b.	886	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies.	6-11-14
155	Tiger	g. b.	886	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies.	6-11-14
155	Luchs	g. b.	886	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies.	6-11-14
155	Jaguar	g. b.	886	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies.	6-11-14
	Tsing-tau	g. b.	168	Interned, China	17- 8-14
	Vaterland	g. b.	168	Interned, China	17- 8-14
154	V-187	d.	689	Sunk by British forces, North Sea	28- 8-14
154	S-115	d.	413	Sunk by English destroyers, North Sea.	17-10-14
154	S-117	d.	413	Sunk by English destroyers, North Sea.	17-10-14
154	S-118	d.	413	Sunk by English destroyers, North Sea.	17-10-14
154	S-119	d.	413	Sunk by English destroyers, North Sea.	17-10-14
154, 162	S-90	d.	396	Driven ashore and wrecked by own crew off Tsing-Tao after having torpedoed the Japanese ship Takachiho	20-10-14
155	Taku	d.	276	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies.	6-11-14
155	S-124	d.	463	Accidentally rammed and sunk by a merchant vessel in Baltic	22-11-14
	V-186	d.	750	By gunfire	—— ——
	S-106	d.	400	By gunfire	—— ——
154	S-126	d.	487	By sm.	6-10-14
159	G-196	d.	689	Sunk by British sm., North Sea	26- 7-15
159	——	d.	——	Announced by France as sunk by two French torpedo-boats off Belgian coast.	22- 8-15
	——	d.	——	Reported sunk by Russians in Baltic	19- 8-15
	——	d.	——	Reported sunk by British sm. E-19 between Denmark and Sweden. Not confirmed	14-10-15
	S-116	d.	447	Sunk by English sm. E-9, North Sea	6-10-14
164	—— (five)	d.	——	Sunk by gunfire, battle of Jutland	1- 6-16
169	——	d.	——	Reported sunk in engagement with British destroyers	1-23-17
	A-2	t. b.	about 150	Sunk by British destroyers, North Sea	15- 1-15
	A-6	t. b.	about 150	Sunk by British destroyers, North Sea	15- 1-15
	——	t. b.	——	Officially announced by Russia, blown up by mine	30- 6-15
	——	t. b.	——	Announced by German Admiralty, sunk by mines, Baltic	19- 8-15
	——	t. b.	——	Announced by German Admiralty, sunk by mines, Baltic	19- 8-15
	——	t. b.	——	Sunk by sm., Baltic	17-12-15
159	—— (eight)	t. b.	——	Gulf of Riga	17- 8-15
	——	t. b.	——	Collision, Baltic	15-10-15
153	U-15	sm.	about 450	Sunk by British c. Birmingham	9- 8-14
155	U-18	sm.	about 450	Destroyed by English d. Garry off Scotch coast	23-11-14
160, 161	U-8	sm.	246-295	Sunk by British destroyers	4- 3-15
	U-51	sm.	——	Sunk, Black Sea	17- 7-15
	U-12	sm.	246-295	Rammed and sunk by British d. Ariel	10- 3-15
157	U-29	sm.	840-980	Announced sunk by British. Loss admitted by German Admiralty	26- 3-15

GERMAN WARSHIP LOSSES—Continued

WHOLE NUMBER	NAME	TYPE	TONNAGE	REMARKS	DATE
	U-14	sm.	about 500	Sunk by British forces	8-6-15
159	U-27	sm.	840-890	Announced by German Admiralty as missing	10-8-15
	U-8 (new)	sm.	900	Sunk by British	4-11-15
156	U-3	sm.	255	Rammed	9-8-14
166	U-41	sm.	——	Sunk by gunfire	24-9-15
166	U-20	sm.	——	Accidentally grounded and destroyed by crew	4-11-16
165	UC-5	sm.	200	Captured by British p. b.	27-4-16
167	——	sm.	——	Captured by British in Mediterranean	11-16
169	——	sm.	——	Foundered off Norwegian coast	1-17
	Friedrich	ax. c.	8,865	Interned, Norfolk	7-4-15
157	Kronprinz Wilhelm	ax. c.	14,705	Interned, Norfolk	29-4-15
155	Berlin	ax. c.	17,324	Interned, Norway	16-11-14
	Patagonia	ax. c.	——	Seized by Argentina, violation of neutrality	16-11-14
	Eber	ax. c.	1,000	Interned, Bahia	9-14
161	Kormoran II	ax. c.	3,508	Interned, Guam	15-12-14
	Prince Adalbert	ax. c.	6,030	Captured by British c.	8-14
	Sudmark	ax. c.	5,113	Captured by British c.	15-8-14
153	Kaiser Wilhelm der Grosse	ax. c.	13,952	Sunk by British c. Highflyer	27-8-14
	Bethania	ax. c.	7,548	Captured by British c.	7-9-14
	Spreewald	ax. c.	3,899	Captured by British c.	12-9-14
153	Cap Trafalgar	ax. c.	18,710	Sunk by British ax. c. Carmania	14-9-14
	Max Brock	ax. c.	4,579	Captured by British c.	9-14
	Graecia	ax. c.	2,753	Captured by English c.	10-10-14
	UC-8	m. m. l.	160-180	Interned in Holland	——
	Markomannia	ax. c.	4,505	Sunk by British c. in Indian Ocean	16-10-14
	Navarra	ax. c.	5,794	Sunk by English ax. c. in Atlantic	11-11-14
	Eleonore Woermann	ax. c.	4,624	Sunk by Australian c. Australia	6-1-15
158	Macedonia	ax. c.	4,347	Captured	30-4-15
162	Greif	ax. c.	1,165	Sunk in battle, North Sea	29-2-16
	Karnac	ax. tr.	4,437	Interned, Chile	11-14
164	Hermann	ax. c.	3,000	Sunk by Russian destroyers	13-6-16
153	Königin Luise	m. l.	2,163	Sunk by English d., North Sea	5-8-14
158, 159	Albatross	m. l.	2,165	Sunk by Russians in Baltic. Reported raised and interned in Sweden	2-7-15
159	Meteor	m. l.	3,613	Sunk by own crew after attempting to escape British forces, North Sea	8-8-11
	Kingani	a. m. v.	——	Captured by the British on Lake Tanganyka	
	Locksun	n. t.	1,020	Interned, Honolulu	8-11-14
158	Ophelia	——	1,153	Captured by English c., North Sea. English claim vessel an ax. c., while Germany claims her a hospital ship	17-10-15
171	——	d.	——	By gunfire, North Sea	8-4-17
171	U-30	sm.	350	Interned, Holland	23-2-17
171	Cormoran	ax. c.	——	Blown up, Guam	6-4-17
172	G-42	d.	——	By gunfire, North Sea	20-4-17
172	G-85	d.	——	By gunfire, North Sea	20-4-17
172	B-6	sm.	——	Interned, Holland	13-3-17
172	UC-39	sm.	——	Sunk, North Sea	4-17
172	——	d.	——	Mine or torpedo, North Sea	13-5-17
173	S-20	d.	——	By gunfire, North Sea	5-6-17
173	——	sm.	——	Torpedoed, Mediterranean	2-6-17

In addition to the above, there seems to be no doubt that a great number of German submarines have been destroyed around the British Isles and possibly also in the Mediterranean and near the Dardanelles.

AUSTRIAN WARSHIP LOSSES

153	Zenta	c.	2,264	Sunk by French fleet off Antivari	16-8-14
155, 162	Kaiserin Elizabeth	c.	3,937	Sunk by her own crew at Tsing-Tao	7-11-14
161	—— (Novara type)	c.	3,384	Torpedoed	13-1-16
	——	g. b.	——	Sunk, Adriatic	24-5-15
	Temes	r. m.	433	Struck a mine and sank off Shabatz	23-10-14
161	Triglav	d.	787	Sunk by gunfire in Adriatic	29-12-15
161	Lika	d.	787	Sunk by mine in Adriatic	29-12-15
153	No. 19	t. b.	78	Struck by a mine and sank at entrance to Pola	18-8-14
	——	t. b.	——	Sunk by mine in Adriatic	
	——	t. b.	——	Sunk by mine in Adriatic	
	——	sm.	——	Sunk by an Italian d.	17-5-15

AUSTRIAN WARSHIP LOSSES—Continued

WHOLE NUMBER	NAME	TYPE	TONNAGE	REMARKS	DATE
	U-18	sm.	685-860	Reported by France sunk by a French aeroplane, Adriatic	1- 7-15
159	U-12	sm.	——	Torpedoed and sunk by an Italian sm., upper Adriatic	12- 8-15
159	U-3	sm.	233-295	Sunk by French d. Bisson	13- 8-15
	——	sm.	——	Gunfire, French fleet	
	U-11	sm.	860	Sunk by aeroplane	1- 7-15
168	VT-12	sm.	——	Captured by Italy	- 1-17
168	VC-12	sm.	——	Captured by Italy	- 1-17
	——	tr.	5,000	Sunk by Italian warships, Dmazzo roads; loaded with munitions	— — —
	——	tr.	3,000	Sunk by Italian warships, Dmazzo roads; loaded with munitions	— — —
162	Elektra	h. s.	——	Torpedoed, Adriatic	18- 3-16
	Beethoven	tr. s.	——	Struck a mine and foundered	17-12-14
172	Thirteen submarines	——	——	Sunk, Adriatic	- 4-17
173	——	t. b.	——	By gunfire, Adriatic	3- 6-17

TURKISH WARSHIP LOSSES

155	Messudyeh	b.	10,000	Sunk by British sm. B-11, Dardanelles	14-12-14
	Kheyr-Ed-Din	b.	9,900	Torpedoed by British, Sea of Marmora	9- 8-15
158	Mejidieh	c.	3,330	Sunk by Russian mine, Gulf of Odessa	3- 4-15
161	Doruk Reis (type)	g. b.	502	Sunk by Russian d	10-12-15
158	Pelenk-I-Derih	g. b.	886	Sunk in Sea of Marmora, British sm.	24- 5-15
	Marmaris	g. b.	492	Sunk by British in Tigris River	1- 6-15
158, 159	Berk-i-Satvet (type)	g. b.	725	By mine near Dardanelles	29- 4-15
161	Issa Reis (type)	g. b.	500	Scuttled	1-11-14
	Malatia	g. b.	210	Officially reported by Petrograd as sunk in Black Sea	10-12-15
	Yadikar Milet	d.	610	Sunk by British sm.	- 5-15
159, 161	Yar Hissar	d.	284	Sunk by British sm., Sea of Marmora	6- 9-15
	Demir Hissar	t. b.	97	Stranded and interned at Chios	17- 4-15
157	Dhair Hissar	t. b.	97	Driven ashore, Greece	17- 4-15
	Nagara	tr.	——	Sunk by British sm., Sea of Marmora	- 5-15
158	—— (three)	tr.	——	Sunk by Russian warships; contained troops	— — —
160	Carmen	tr.	4,424	Sm., Marmora	24-10-15
161	Rechid Pasha	tr.	8,000	Sm., Marmora	12-12-15
	Bezemialen	tr.	——	Sunk, Black Sea	14-11-14
	Bachriachmar	tr.	——	Sunk, Black Sea	14-11-14
	Midiat Pasha	tr.	——	Sunk by sm.	14-11-14
166	Rodosto	tr.	6,000	Captured by Russian sm.	-10-16

In addition to the above, other Turkish men-of-war may have been destroyed around the Dardanelles and in the Black Sea. Reports from England, Russia and Turkey in regard to these operations are so conflicting that it is impossible to accurately state what Turkish vessels have been destroyed, especially transports and supply ships.

INDEX OF WAR VESSEL LOSSES MENTIONED IN THIS NUMBER

BRITISH VESSELS	PAGE	GERMAN VESSELS	PAGE
1 destroyer	1610	1 destroyer	1603
Avenger (converted cruiser)	1606	1 Zeppelin	1604
Hilary (converted cruiser)	1610	1 Zeppelin	1602
		1 submarine	1610
FRENCH VESSELS		AUSTRIAN VESSELS	
1 destroyer	1598	1 torpedo-boat	1611

DIPLOMATIC NOTES

FROM MAY 18 TO JUNE 18

Prepared by A. F. WESTCOTT, PH. D., Instructor, U. S. Naval Academy

ALLIES RE-STATE WAR AIMS

At the request of the Russian Government, and by way of response to the prevalent sentiment in Russia for peace "without annexations and without indemnities," the United States and Great Britain have re-stated their war aims in notes to the Russian Government.

PRESIDENT WILSON'S MESSAGE.—President Wilson's Note, delivered May 26 and published June 10, laid down the principles that "No territory must change hands except for the purpose of securing those who inhabit it a fair chance of life and liberty," and "No indemnities must be insisted on except those that constitute payment for manifest wrongs done." The text follows:

"In view of the approaching visit of the American delegation to Russia to express the deep friendship of the American people for the people of Russia and to discuss the best and most practical means of co-operation between the two peoples in carrying the present struggle for the freedom of all peoples to a successful consummation, it seems opportune and appropriate that I should state again, in the light of this new partnership, the objects the United States has had in mind in entering the war. Those objects have been very much beclouded during the past few weeks by mistaken and misleading statements, and the issues at stake are too momentous, too tremendous, too significant for the whole human race to permit any misinterpretations or misunderstandings, however slight, to remain uncorrected for a moment.

"The war has begun to go against Germany, and in their desperate desire to escape the inevitable ultimate defeat those who are in authority in Germany are using every possible instrumentality, are making use even of the influence of groups and parties among their own subjects to whom they have never been just or fair or even tolerant, to promote a propaganda on both sides of the sea which will preserve for them their influence at home and their power abroad, to the undoing of the very men they are using.

"The position of America in this war is so clearly avowed that no man can be excused for mistaking it. She seeks no material profit or aggrandizement of any kind. She is fighting for no advantage or selfish object of her own, but for the liberation of peoples everywhere from the aggressions of autocratic force. The ruling classes in Germany have begun of late to profess a like liberality and justice of purpose, but only to preserve the power they have set up in Germany and *the selfish advantages which they have wrongly gained for themselves and their private projects of power all the way from Berlin to Bagdad and beyond. Government after government has by their influence, without open conquest of its territory, been linked together in a net of intrigue directed against nothing less than the peace and liberty of the world. The meshes of that intrigue must be broken, but cannot be broken unless wrongs already done are undone; and adequate measures must be taken to prevent it from ever again being rewoven or repaired.*

"Of course, the Imperial German Government and those whom it is using for their own undoing are seeking to obtain pledges that the war will end in the restoration of the status *quo ante*. It was the status *quo ante* out of which this iniquitous war issued forth, the power of the Imperial German Government within the Empire and its widespread domination and

influence outside of that Empire. That status must be altered in such fashion as to prevent any such hideous thing from ever happening again.

"We are fighting for the liberty, the self-government, and the undictated development of all peoples, and every feature of the settlement that concludes this war must be conceived and executed for that purpose. Wrongs must first be righted, and then adequate safeguards must be created to prevent their being committed again. We ought not to consider remedies merely because they have a pleasing and sonorous sound. Practical questions can be settled only by practical means. Phrases will not accomplish the result. Effective readjustments will; and whatever readjustments are necessary must be made.

"*But they must follow a principle, and that principle is plain. No people must be forced under sovereignty under which it does not wish to live. No territory must change hands except for the purpose of securing those who inhabit it a fair chance of life and liberty. No indemnities must be insisted on except those that constitute payment for manifest wrongs done. No readjustments of power must be made except such as will tend to secure the future peace of the world and the future welfare and happiness of its people.*

"And then the free peoples of the world must draw together in some common covenant, some genuine and practical co-operation that will in effect combine their force to secure peace and justice in the dealings of nations with one another. The brotherhood of mankind must no longer be a fair but empty phrase; it must be given a structure of force and reality. The nations must realize their common life and effect a workable partnership to secure that life against the aggressions of autocratic and self-pleasing power.

"For these things we can afford to pour out blood and treasure. For these are the things we have always professed to desire, and unless we pour out blood and treasure now and succeed, we may never be able to unite or show conquering force again in the great cause of human liberty. The day has come to conquer or submit. If the forces of autocracy can divide us they will overcome us; if we stand together, victory is certain and the liberty which victory will secure. We can afford then to be generous, but we cannot afford then or now to be weak or omit any single guarantee of justice and security.

"WOODROW WILSON."

GREAT BRITAIN'S REPLY.—In a note to Russia published June 11, the British Government stated that their purpose in entering upon the war was "to defend the existence of their country and enforce respect for international engagements; to those objects has now been added that of liberating populations oppressed by alien tyranny." The government rejoiced in Russia's expressed intention of liberating Poland, not only Russian Poland but that part controlled by the Germanic Powers. They joined their Russian allies in approving the principles laid down in President Wilson's historic message to the American Congress. They believed that the agreements made by the British Government with their allies were conformable to these standards, but, if the Russian Government so desired, they were quite ready to examine and, if need be, revise these agreements.

FRANCE INSISTS ON RESTITUTION AND REPARATION.—In a vigorous speech before the Chamber of Deputies on May 22, Premier Ribot insisted that "restoration of our lost provinces must not be regarded as a question of annexations," and that reparation must be made for ravages in invaded

provinces and in the territories of Belgium, Serbia, Rumania, and Montenegro.

On June 5 the Chamber of Deputies, by a vote of 453 to 55, adopted the following resolution declaring that peace conditions must include reparation and the restoration of Alsace-Lorraine:

"The Chamber of Deputies, the direct expression of the sovereignty of the French people, salutes the Russian and other allied democracies, and indorses the unanimous protest which the representatives of Alsace-Lorraine, torn from France against their will, have made to the National Assembly. It declares that it expects from the war imposed upon Europe by the aggression of imperialist Germany the return of Alsace-Lorraine to the mother country, together with liberation of invaded territories and just reparation for damage.

"Far removed from all thoughts of conquest and enslavement, it expects that the efforts of the armies of the republic and her allies will secure, once Prussian militarism is destroyed, durable guarantees for peace and independence for peoples great and small, in a league of nations such as has already been foreshadowed."

WARNING FROM JAPAN.—WASHINGTON, June 5.—It was learned here to-day that Japan has notified the Russian Provisional Government that if Russia withdraws from the war Japan, in consultation with Great Britain, will consider what measures to take. It was intimated that Japan and Great Britain would exchange views with the United States concerning the Russian situation.

It is understood that the Russian Provisional Government has been warned that if she accepted a separate peace with the Central Empires her action would be almost equivalent to aligning herself with Germany, and that so far from gaining anything by it she would become another Austria under German domination.—*N. Y. Times*, 4/6.

STATEMENT EXPECTED FROM RUSSIA.—WASHINGTON, June 14.—The Entente Powers, having expressed through Great Britain a willingness to revise the terms of the Entente Alliance as relates to war aims, are prepared to ask the Russian Provisional Government a definition of Russia's position and a declaration of her intentions. The statement was made to-day that the Entente Powers had carefully examined the situation and reached these conclusions:

"1. That the position occupied by Russia affects the entire plans of the Allies, especially as regards military operations in the near future contemplated by England, France and Italy.

"2. That nothing Russia does can irreparably damage the cause or the interests of the Allies.

"3. That Japan can be counted upon to prevent Russia from forming an alliance with Germany or of giving aid to the Central Powers."

REBELLION AT KRONSTADT.—On May 30 the local Council of Workmen's and Soldiers' Delegates assumed control of the fortress and island of Kronstadt and refused to recognize the Provisional Government. A temporary settlement was made on June 1 by members of the Cabinet who visited the island, but this was soon violated, and on June 9 the Provisional Government, fully supported by the Petrograd Council of Delegates, issued a strongly phrased order for submission.

The Kronstadt affair is considered important chiefly as a test of the will and power of the Provisional Government to control the country.

AMERICAN ENVOYS REACH PETROGRAD.—The American mission, headed by Elihu Root, and the American Railroad Commission, headed by John F. Stevens, arrived in Petrograd on June 13. The Railroad Commission, according to a statement from Mr. Stevens, will at once establish relations with the Transportation and War Departments, and facilitate the purchase in the United States of necessary construction materials, war munitions, iron and coal.

THE STOCKHOLM CONFERENCE

Pending the arrival of delegates from the enemy powers, the representatives of the Germanic Powers at the Stockholm Socialist Conference issued on May 30 the following peace program:

"First—No annexations.

"Second—No indemnities.

"Third—The South Slavic lands and Austro-Hungarian crown lands to remain in the Dual Monarchy.

"Fourth—Finland and Russian Poland to be independent states; the people of Galicia to have autonomy under the sovereignty of Austria.

"Fifth—Restoration of freedom of commerce on land and sea; modification of the protectionist system; the establishment of 'international administration' for all maritime routes and interoceanic canals; internationally built and administered railways.

"Sixth—Return to the maritime principle established by the Paris peace treaty of 1856, especially regarding the prohibition of the capture or arming of merchantmen; abolishment of prize courts; reduction of the contraband list, taking therefrom especially all raw materials for clothing or food; modification of the rights of blockade and 'restriction of mechanical means which may be employed in maritime and air warfare.'

"The delegates go on record as opposing the annexation of Belgium and declare themselves as 'being friendly to Serbia's independence, which state, by joining with Montenegro, can assure itself of an outlet to the sea.'

"They declare that the Balkan States should arrange their own internal affairs without outside interference.

"The future of Alsace and Lorraine is not mentioned.

"The Czech, Polish and Bosnian delegates attended the group conference, but did not join in the program. They will formulate their own program later.

"The agreement of the German and Austrian Socialists, if carried out, would leave their nations stronger abroad and more centralized politically at home than they were before the war. Turkey is defended, and Italy's right to 'Italia Irredenta' is not recognized, nor is France's to Alsace-Lorraine."—*N. Y. Times*, 31/5.

SOCIALIST DELEGATES AT STOCKHOLM AND PETROGRAD.—Among the German delegates reported at Stockholm in despatches of June 4 were seven representatives of the Majority German Socialists, headed by Philip Scheidemann. The American delegates, Hillquit, Berger and Lee, were denied passports by the State Department on the ground that unauthorized individuals from this country may not confer with delegates who have at least a quasi-official status from a foreign power. Three British Socialists have been granted passports, not to Stockholm, but to Petrograd, at the request of the Russian Government. Premier Ribot announced on June 1 that no passports would be issued to French delegates to Stockholm.

Writing to the *London Chronicle* from Petrograd on June 7, Emile Vandervelde, Belgian Ministry of Munitions and Socialist leader, noted

the gathering in Russia of Socialist representatives of the Allied Powers—two from Belgium, two from Italy, two in the American mission led by Elihu Root, Albert Thomas, representing France, and Arthur Henderson, representing England. These representatives, in conference with the Council of Workmen's and Soldiers' Delegates, opposed an international Socialist conference such as the council proposed, on the ground that negotiations with the German Majority Socialists, so long as they pursued their present policy, would be futile and dangerous. M. Vandervelde announced that a conference of Socialists from the Allied Powers would be held in London in July.

THE GERMANIC POWERS

RESIGNATION OF COUNT TISZA.—Count Stefan Tisza, premier of the Hungarian Kingdom since 1913, resigned on May 23, and was succeeded on May 31 by the Liberal leader, Count Julius Andrássy. Count Tisza's resignation followed a conference with the Emperor over proposals for the extension of the Hungarian franchise, and is understood to have resulted from his insistence on Maygar supremacy and his unwillingness to extend political privileges to Slav, Polish and other non-Maygar elements in Hungary.

By the German press the change was welcomed as presaging a shift from dualism to "trialism" in the control of Austria Hungary, and as a means of bringing Poles and Slavs into more willing support of Germanic power. Though an exponent of autocracy, Tisza was, at times, suspicious of German influence in the Dual Empire.

The Allied press regarded the fall of Tisza and the assembly of the Austrian Reichstat on May 31 as signs of an inclination to more liberal and constitutional government on the part of the new Emperor, and a tendency to shake himself free from German control.

GERMANY'S GRIP ON SOUTHEASTERN EUROPE

Press despatches from Washington of May 20 contained extended accounts, by no means new to readers of M. Cheradame and other students of European political history, of Germany's schemes for the domination of southeastern Europe, and the tremendous advantage she would gain by a premature peace based on nominal return to conditions preceding the war.

To quote the despatches:

"This information disclosed as one of the primary aims of the war a plan for consolidation of an impregnable military and economic unit stretching from the North Sea to the Mediterranean, cutting Europe permanently in half, controlling the Dardanelles, the Aegean, and the Baltic, and eventually forming the backbone of a Prussian world empire.

"The subjugation of Austria-Hungary, which would have presented a difficult task under ordinary conditions, became in the circumstances compartively simple. A polyglot combination of states having little in common and apparently held together only by the decaying genius of the aged Emperor Francis Joseph, the dual monarchy was regarded everywhere as on the verge of dissolution. Her helplessness before Russia's

armies became apparent early in the war, and the eagerness with which Germany seized the opportunity thus presented is pointed to as emphasizing the far-sightedness of the German plans.

"Austria-Hungary's submission now is declared to be complete both in a military and economic sense. The German officers commanding her armies, abetted by political and industrial agents scattered through the country by Germany evidently are holding the Austrian and Hungarian populations in a union which neither the hardships of war, the death of the Emperor nor the inspiration of outside influences such as the Russian revolution can break.

"Bulgaria's declaration of war on the side of Germany was actuated by a German diplomatic coup which in itself is regarded now as a further evidence that a clear road through to the Dardanelles was considered in Berlin as a primary and imperative purpose of the war. It is pointed out that the only concrete cause for action set forth in the Bulgarian war proclamation is that 'the Central Powers have promised us parts of Serbia, creating an Austro-Bulgarian border line.' Creation of such a junction now well established by the Austro-German-Bulgarian armies, breaks down a hitherto formidable barrier to German expansion southeastward.

"In the case of Turkey, German domination is believed here to be even more complete than in Austria-Hungary or Bulgaria. Not only have German officers led in defending Turkish territory and in eradicating inharmonious elements such as the Armenians and Syrians, but it has been learned that German industrial organizers have taken a firm grip on Turkish industry and a large delegation of German professors has been sent to spread German kultur among the population.

"Fitting in squarely with an actuating desire for conquest to the southeast is the general German military policy during the entire war. It is noted that even at the expense of recessions on the eastern and western fronts, Germany has taken pains to overrun quickly Serbia, Montenegro, and Rumania, and to keep in check all allied attempts to strike at the southeastern pathway from the Dardanelles or Saloniki. Not until the present British advance in Asiatic Turkey has there been any serious danger to any part of the greater stretch from the Baltic to the Persian Gulf.

"It is problematical to officials here how far Germany might go, should peace be made now with renunciation of all territory on the east and west, in political consolidation of the great territory in the southeast. It is pointed out that any German peace offer would be expected to demand at least some expansion for Bulgaria and the retention of enough of the conquered Balkan territory to insure the route to Constantinople. That it is the intention to bring Austria-Hungary, Bulgaria, and Turkey into a customs union, Germanizing their industries, and to surround the whole economic entity thus established with a formidable tariff wall, has been made clear by the declarations of Friedrich Naumann and other exponents of an economic mittel Europa.

"The turn of affairs is accepted, too, as bringing Austria-Hungary more clearly into relief as the area of possible operations to impose a barrier between Berlin and Constantinople. In that connection is recalled the declaration of the Allies, replying to President Wilson's peace note in the light of knowledge which only now has become available here, that the war must accomplish 'the liberation of Italians, of Slavs, of Rumanians, and Czecho-Slovacs from foreign domination, the enfranchisement of populations subject to the bloody tyranny of the Turk, the expulsion from Europe of the Ottoman Empire,' and the restoration of Serbia, Montenegro, and Rumania.

"Such a program, it is pointed out, would effectually break up the greater Germany now established as the nucleus of a world Germany. It would impose a Rumanian-Serbian barrier between Austria and Bulgaria; would further enlarge this barrier by restoring to Rumania her

3,500,000 nationals in Eastern Hungary and probably to Serbia 5,500,000 Serbo-Croatians in Southern Austria and a large section of Bulgaria; would establish at the crucial southern point of the Dual Empire a free nation of 7,000,000 Czecho-Slovacs and in the north a free Poland by the addition of 5,000,000 Poles now under Austrian rule; would restore 1,000,000 Italians to Italy and upward of 2,000,000 Slavs to Russia; and in addition would dismember the then detached Turkish territory to the south by liberating the Armenians and Syrians and removing the Dardanelles from German domination.

"American officials have made it clear that in cooperating with the Allies the United States was not entering a binding alliance to accomplish definite and detailed territorial aims; but there is every evidence that the government understands in concrete form the crucial southeastern element of the situation and realizes the enormity of the struggle that must be won before the world is made 'safe for democracy.'"

SPAIN AND THE WAR.—The fall of the Prieto Cabinet in Spain, after little more than a month in office, was followed on June 12 by the formation of a new ministry by Eduardo Dato. The success of the Dato Cabinet will depend on its ability to cope with the strife in Spain between the army and the civil power. As regards the war, the new cabinet, like its predecessor, is committed to a policy of absolute neutrality. It has the support of the Liberal majority in the Cortes and of the Liberal leader Count de Romanones.

The Spanish Government received on May 22 what was regarded as a satisfactory reply from Germany to the Spanish protest at the attack on the vessel *Patricio* in Spanish territorial waters. A more significant answer may be seen in the sinking, reported May 27, of the Spanish vessel *Begota*, and the loss of the mail steamer *C. de Eizaguirre* with the sacrifice of 80 or more lives.

GREECE

ABDICATION OF KING CONSTANTINE.—On June 12, King Constantine abdicated the throne of Greece in favor of his second son, Prince Alexander. The abdication followed a conference in Savoy between Premier Lloyd George and representatives of France and Italy, at which the present policy was agreed upon and the French statesman, Senator Jomart, was appointed representative of France, England and Russia with plenary powers to deal with Grecian affairs. The fall of the Czar is considered to have removed the last obstacle to summary action against King Constantine. His forced abdication at this time forestalled his plan to secure control of the Thessalian grain harvest, which would have enabled him for a considerable period to defy an Allied blockade. Despatches of June 13 stated that French and British troops had been landed in Thessaly and Corinth, and had occupied Athens.

Considerable criticism appeared in the British press at the continuance of the present dynasty. Constantine's second son, however, is regarded as an admirer of Venizelos and intensely pro-Entente. A year ago it was reported that he had thrown up his commission as captain in the artillery to join Venizelos's volunteers. He was born August 1, 1893.

PARTY STRIFE IN CHINA.—On May 23, President Li Yuan Hung dismissed Premier Tuan-Chi-jui. Tuan had previously lost the support of Parliament and of his own Cabinet, and his downfall is reported to have developed from his efforts to force China to a declaration of war, without being able to bear out his promises of rewards from the Allies in the event of such action. When China broke off diplomatic relations with Germany, the Parliament acted not primarily at the instance of Tuan or the Japanese influences by which he was controlled, but rather as a result of the activities of the American Minister.

Following Tuan's downfall, conservative elements in the North rallied to his support. Eleven of the 18 provinces of China broke off relations with the Central Government, and press despatches of June 3 reported the formation of a rival government with Hou-Shih-Chang as dictator and Tsao Ju-lin as foreign minister, the latter strongly pro-Japanese.

According to last accounts President Li was still in power and undecided whether or not to promulgate a decree dissolving Parliament. Such action would force a new election and postpone for six months or more a decision to enter the war.

The turmoil in China is ascribed to internal party strife and jealousy between the northern and southern provinces, rather than to any genuine disagreement over China's foreign policy, in which governmental and public opinion strongly incline to active support of the Western Powers.

REVIEW OF BOOKS

ON

SUBJECTS OF PROFESSIONAL INTEREST

"Breaches of Anglo-American Treaties." A Study in History and Diplomacy. By Major John Bigelow, U. S. Army, retired. $1.50 net. (New York: Sturgis and Walto Co., 1917.)

More controversies have existed between the United States and Great Britain than between the United States and any other countries, and two out of the five foreign wars to be found in the history of the United States were with the same country. It is no wonder, then, that the German propaganda consists and consisted largely in stirring up the ancient animosities and by thus drawing a herring across the trail leading toward war with Germany endeavoring to avert hostile relations and obscure the tragic results of the submarine warfare against us and against civilization and humanity.

This little book may or may not have been published for this purpose but if it is intended to record a history of Anglo-American diplomacy it is unsatisfactory from its fragmentary nature and from its missions. The history of Anglo-American diplomacy is yet to be written.

It claims, however, that beginning with the treaty of peace at the end of our war of independence that it considers "all of the treaties, conventions and similar agreements negotiated between Great Britain and the United States that may be regarded as broken by either of the contracting parties," and yet we find no mention of the controversy about the Maine boundary, with its accompanying Aroostook war, and with its agreement to refer to arbitration this question, which resulted in a decision adverse to the claims of the United States and which was further followed by a repudiation of the arbitration by the United States, the only refusal to abide by an arbitration that I can recall in our history. I trust that it will continue to be the sole example of its kind.

In the controversy arising under the Jay Treaty of 1795, the action of the United States is condemned by the author and in his summing up he says "that the commission had at least as much right as the government of the United States to decide what cases came within its jurisdiction and that its exercise of such right in the manner stated, however disagreeable, and even unfair to the United States, was not a violation of the treaty. A similar decision of the Geneva Conference as to the indirect claims against Great Britain arising from the damages caused by the Confederate cruisers calls for a condemnation by the author although Charles Francis Adams, our commissioner, agreed with the other members of the tribunal that such claims were not within the jurisdiction of

the tribunal. There can be no doubt of Mr. Adams' fidelity to his country, his services as Minister to England proved that fact and history, diplomacy or international law cannot be shown to agree with the statement of the author that failure by the tribunal to arbitrate the indirect claims was due to political interference from both sides; and to a violation of the treaty by both of the contracting parties. This assertion is not justified by the circumstances.

A very brief reference is made with respect to the fisheries questions with the Maritime provinces of Canada. In stating the results of the Hague arbitration upon these questions the author claims that the case of the United States proved on the whole a considerably better one than that of Great Britain but that the award seems to show violation of the treaty by both parties. This is rather a questionable statement.

A very considerable part of the book is taken up with the unfortunate Clayton-Bulwer Treaty. The author gives an interesting description of the principals in this famous negotiation. Clayton an accomplished lawyer but no diplomatist, Bulwer an accomplished diplomatist but no lawyer. He shows that a successful lawyer may prove an unsuccessful diplomatist and *vice versa*. When we think of the results the negotiations with Reverdy Johnson assisting the able lawyer, who as attorney general helped Clayton in the negotiation of this treaty, and the results of Johnson's own treaty and negotiations when he was Minister to Great Britain upon the Alabama question, we are likely to be confirmed as to the wide difference between the lawyer and the diplomatist.

The claim of the author that Bulwer falsified the records in the negotiations and introduced into the files of the State Department, in some improper way, a letter that now reposes in the archives of the department may or may not be true. It is doubtful, however, to the mind of the reviewer that the author proves the charge. C. H. S.

"Central Europe: A Translation by Christabel M. Meredith from the Original German of *Mittel-Europa*." By Friedrich Naumann, member of the Reichstag. $3.00. (New York: Alfred A. Knopf, 1917.)

According to the Westminster *Gazette*, "The special interest of this book is that it is regarded by the Allies as an authoritative pronouncement of German intentions, and has been made the basis and justification of the resolutions of the Paris Conference . . . ." The somewhat different comment of Professor William R. Shepherd of Columbia University is as follows: "A highly interesting discussion by a brilliant German publicist of an economic union of the states of Central Europe as a possible outcome of the war. It deserves close attention by the American reader, regardless of the location of his sympathies oversea." The present reviewer would add that "Central Europe" is what close students of the Pan-German plot have been looking for, namely, proof of the contentions of M. André Chéradame, whose book, "The Pangerman Plot Unmasked," was reviewed in the U. S. Naval Institute PROCEEDINGS for April, 1917, pages 882 and 883. Those who read the review in question will remember the most important thesis of M. Chéradame's arraignment—"Germany's

most dangerous move is 'the formidable peace-trap of the drawn war,' by which the Allies and the world in general will be lulled into a false sense of security, should an inconclusive peace be accepted. In other words, *Germany will actually win the war, and gain strength enough to carry out her gigantic plot in the future, if by the terms of peace she is permitted to retain her control over Austria-Hungary*—and, beneath the surface, her control of the Balkans and Turkey."

M. Chéradame's testimony and his warning seemed most convincing to the reviewer. Nevertheless, the witness, however expert, was a Frenchman, and open to the charge of interest and prejudice. How could the truth of his testimony be clinched? Surely in no better way than by the voice of some representative German writer, who, in true German fashion, like Bernhardi, should "give the thing away"—"let the cat out of the bag." The one thing lacking was some blundering German propagandist, some writer inspired or duped by the military masters of Germany.

The lack has now been filled—by none other than Friedrich Naumann. "Central Europe" is an argument so specious that the word specious might have been invented for the purpose of characterizing its naive disclosures of the cloven hoof. Give a German publicist of the modern type rope enough, and he will hang himself. And Naumann is true to type. In the very first paragraph of his book he recognizes precisely what we are looking for, that Middle Europe cannot, could not be fashioned "except in the midst of bloodshed and the upheaval of war." Naumann congratulates Germany and Austria that this "war in self-defence" (of course) has given the Central Powers the *one possible opportunity* for the creation of Middle Europe. He expects us to believe that no one thought of creating Middle Europe by means of war until war was "thrust upon Germany and Austria." He forgets the publication of Otto Tannenberg's book of 1911—"Grossdeutschland, die Arbeit des 20ten Jahrhunderts"; he forgets the notorious disclosures of Bernhardi in "Germany and the Next War."

Naumann, throughout the book, shows the most shocking blindness of "us Germans" to the vastly important matter of tact. Since the object of the book is to win the friendship of the people of Austria-Hungary, one would suppose that Naumann would seek to gain their good will and their confidence in German purposes. Yet he speaks of the Austro-Hungarians of all nationalities with differing degrees of poorly concealed contempt, reserving the most respect for the Austrian Germans, but considering even these as markedly inferior to the real Germans, among whom the Prussians are, of course, of the first rank. To any Austrian or Hungarian who is not too stupid to "see through" Naumann's book, it must be an insult from cover to cover.

"The German Empire," he says, "is more northerly, colder, more uniform, more technical. Austria-Hungary is more southerly, more brightly colored, more a natural growth, more romantic." (What clumsy depreciation of Germany! What elephantine flattery of Austria-Hungary! From the Prussian-German point of view, what charitable, friendly, patting of poor old Austria on the back! From the Austrian point of view, what

unbearable condescension!) In like vein is expressed the attitude toward enemies and allies. "Whenever the French are willing we shall be able to extend to them the hand of friendship." As if this were not too incredible as a gesture of "friendship," Naumann continues by saying, "France has chosen to link her *fate* with that of England, and from henceforth will be made use of by England" . . . . becoming "*a larger and more important Portugal.*" Germany's ally, Turkey, is dismissed with this tactful little phrase: "Turkey is southern, oriental, antiquated." "In this case," (that of Turkey) "the *nucleus of crystallization must first be in existence* before the conditions of *accession to the union* can profitably be discussed." Here, in one breath, Naumann insults the Turks, speaks as if the absorption (*i. e.*, the "accession") of Turkey by Germany were in the nebulous future instead of a fact even now largely accomplished, tries thus to lull the reader into thinking that Germany does not take Turkey very seriously and is not seeking to dominate the Turkish Empire to the Persian Gulf, and, finally, refers to the "accession of Turkey to the union" (that is to say, the welding of Turkey into Middle Europe) as a matter to be taken for granted. Could any mind but a German mind be at once so intolerably insolent to an ally, so naively transparent, so certain of the stupidity of others or of their wholesome fear, and so totally unaware of or indifferent to the disclosure of purpose thus made?

Austria-Hungary, throughout the book, is treated like an inferior nation or conglomeration of nations, a pitiable protégé, with immense possibilities under German tutelage, an ally who would be helpless without the strong arm of Germany, and who "should never for one moment forget it, either," a convenience to Germany so essential to the formation of Middle Europe (and, between the lines, so essential to German world domination) that Naumann, for one, seems almost in a state of heart disease for fear that Austria and Germany will be "secret opponents," as he crudely admits, at the International Peace Conference.

Fortunately, the Pan-German plot has now been fully and clearly revealed by President Wilson in his recent Flag Day address, on June 14. Therefore, if Americans are still disposed not to believe M. Chéradame, if they are by any chance unable to see through Friedrich Naumann, they can listen to the President of the United States: "The demands made by Austria upon Serbia were a mere single step in a plan which compassed Europe and Asia, from Berlin to Bagdad." "The war was begun by the military masters of Germany, who proved to be also the masters of Austria-Hungary." "Their purpose has long been avowed." But "The statesmen of other nations, to whom that purpose was incredible, paid little attention; regarded what German professors expounded in their classrooms and German writers set forth to the world as the goal of German policy as rather the dream of minds detached from practical affairs, as preposterous private conceptions of German destiny, than as the actual plans of responsible rulers; but the rulers of Germany themselves knew all the while what concrete plans, what well-advanced intrigues lay back of what the professors and the writers were saying." "Their plan was to throw a

broad belt of German military power and political control across the very center of Europe and beyond the Mediterranean into the heart of Asia; and Austria-Hungary was to be as much their tool and pawn as Serbia or Bulgaria or Turkey. . . . . Austria-Hungary, indeed, was to become part of the central German Empire, absorbed and dominated by the same forces and influences that had originally cemented the German states themselves."

In other words, the cement which Bismarck called "Blood and Iron" is to make Austria-Hungary an integral part of the German Empire, unless the Allies now fighting the Central Powers can prevent the success of the Pan-German plot. Lord Cromer was not far wrong when he vouched for the accuracy of "The Pangerman Plot Unmasked," and Chéradame's charge concerning the danger of the "drawn game." The "drawn game," or "No annexations; no indemnities" policy, has all but deceived the radical elements in Russia. Again to quote President Wilson, "Do you not now understand the new intrigue, the intrigue for peace, and why the masters of Germany do not hesitate to use any agency that promises to effect their purpose, the deceit of the nations? . . . . They are employing liberals in their enterprise. They are using men, in Germany and without, as their spokesmen whom they have hitherto despised and oppressed, using them for their own destruction—Socialists, the leaders of labor, the thinkers they have hitherto sought to silence." . . . . "But they will make no headway. The false betray themselves in every accent."

Likewise does Naumann betray himself and his masters. Apparently he leans toward liberalism and democracy. At one moment he recognizes that "The Napoleonic period has a special significance for the soul of Central Europe, because it planted a political and *democratic* spirit in the people." At another moment he unwittingly lets us see the wires which pull Naumann the puppet: "The rulers remaining to us out of the multitude of early sovereigns *still serve as our models* in many things in life, and *are supreme over our great armies in war and peace. Theories* to the contrary notwithstanding, this is the *fact!*" "The early German Emperors are Central European figures in the fullest sense of the word, and the type is thus only now *becoming recognizable again.*"

H. C. WASHBURN.

"Fundamentals of Naval Service." By Commander Yates Sterling, U. S. Navy. $2.00 net. (Philadelphia: J. B. Lippincott Co.)

"Fundamentals of Naval Service," by Commander Yates Sterling, U S. Navy, is a compendium of diversified knowledge on naval matters in one handy volume. It furnishes to all who will peruse its pages a fund of information that is otherwise hard to find because scattered through so many books.

For the benefit of those readers who may desire to acquire more elaborate and detailed information on the many subjects covered the author has very thoughtfully supplied a comprehensive bibliography. This book should be of interest to all Americans regardless of whether

they are "coasters" or "inlanders" and of especial interest to those who may be contemplating casting their fortunes with the navy as a career.

With many chapters the reader is impressed with the author's necessity of cutting them short in order to avoid making a cumbersome volume. This is particularly noticeable in the chapters on

Our Naval Policy.
The Importance of Naval Strength.
Principles of Naval Strategy.
Military Character.
The Fleet.
The War Portfolio and the Work of a Naval General Staff.

As the reader goes along in reading any one of these chapters he hopes in vain that the subject in hand will be treated at length, or at least more fully than is actually the case. This feeling, however, does not obtain exactly in reading some of the chapters in Part IV, where lengthy quotations are made from Naval Regulations and Instructions. It is admitted that these regulations and instructions are of manifest importance to those who have to follow their precepts, but it is not believed that even the most optimistic enthusiast, at an unguarded moment, will claim for these regulations and instructions interesting and entertaining reading.

Despite the fact that the subject matter is under one cover the book seems naturally to divide itself into two volumes, Parts I, II and III being closely allied, constituting the first volume, while Parts IV and V go very well together in the make-up of the second volume. Parts IV and V seem to be rather an anti-climax to Parts I, II and III, rather than a climax.

In view of the submarine activities at the present time it seems that one passage which appears on page 157, and is given below, furnishes food for thought:

"If a nation should build only submarines against one building only surface vessels, the latter by controlling the surface could eventually win the decision by the destruction of all enemy submarines. The former nation, the one having only submarines, would be forced to employ guerilla tactics and the sea being 'covered' by enemy guns, mounted upon numerous surface ships, would soon find itself impotent against its enemy."

S. G.

NAVAL ACADEMY GRADUATES' ASSOCIATION

It is the sad duty of the Council to report the death of the President of the Association, Rear Admiral John H. Upshur, U. S. Navy (Ret.)., who died in Washington, D. C., on May 30, 1917.

Rear Admiral Upshur was born in Virginia on December 5, 1823. He was appointed to the Naval Academy from the same state on November 4, 1841, and was graduated in 1847. He was placed on the retired list on June 1, 1885, with the rank of Rear Admiral.

Rear Admiral Upshur succeeded to the Presidency of the Association upon the death of Mr. John Wilkes, Jr., July 6, 1908.

Under the provision of the constitution that the oldest living graduate who is a member of the Association shall be the President thereof, this honor falls to Mr. William R. Mercer, date of '41.

Mr. Mercer resigned from the service, Jan. 24, '59, as lieutenant, and his present address is "Aldie," Doylestown, Pa.

CHANGES IN REGISTER

64 Date '41 Upshur, John H. Ret., June 1, '85, R. Adml.; died, May 30, '17, Washington, D. C.

165 " '41 Mercer, William R. PRESIDENT. Res., Jan. 24, '59, Lieut.

894 Class '68 Parsons, Arthur Herbert. Res., Dec. 7, '71, Master; died, April 17, '17, Chicago, Ill.

1018 " '70 Collins, John Bartholomew. Ret., June 30, '09, Commo.; died, April 12, '17, Annapolis, Md.

1243 " '75 Willits, George Sidney. Ret., Feb. 21, '15, R. Adml.; died, May 3, '17, Woodbury, N. J.

2046 " '91 Theall, Elisha. Colonel, U. S. M. C.

3214 " '08 Thomas, Clarence Crase. Died, Apr. 28, '17, Lieut., at Sea, following the sinking of S. S. *Vacuum*.

3278 " '08 Heron, Kenneth. Died, June 1, '17, Lieut. (J. G.), Bremerton, Wash.

MIDSHIPMEN, DATE OF 1913, GRADUATING MARCH, 1917

182 MEMBERS

No.	Name	State in which born	State from which appointed	No. in Grad. Ass'n.
4642	Haeberle, Frederick Edward	Mo.	Cal.	2815
4643	Ostrander, John Edwin, Jr	Idaho	Mass.	2816
4644	Brady, Edmund Edward, Jr	Maine	Maine	2817
4645	Maples, Houston Ledbetter	Ala.	Ala.	2818
4646	McIver, George Wilcox, Jr	Cal.	Cal.	2819
4647	McKee, Andrew Irwin	Ky.	Ky.	2820
4648	Oster, Henry Richard	N. Y.	N Y.	2821
4649	Dees, Randall Euesta	Miss.	Miss.	2822
4650	Campbell, Colin	Kan.	Kan.	2823
4651	Huschke, Paul William	Germany	Ore.	
4652	Schumacher, Theodore Leon	Minn.	Minn.	2824
4653	Johnson, Clarence Willard	Cal.	Minn.	2825
4654	Coe, Douglas Witmer	Minn.	Minn.	2826
4655	Fahrion, Frank George	W. Va.	W. Va.	2827
4656	Noble, Albert	Tex.	Okla.	2828
4657	Rawlings, Norborne Lewis	Va.	Va.	
4658	Kiland, Ingoff Norman	S. Dak.	Wis.	2829
4659	Dean, Frank Homewood	Del.	Del.	2830
4660	Mitchell, Edward Alexander	Conn.	N. Y.	2831
4661	Klein, Harold Samuel	Pa.	Pa.	2832
4662	Douglas, Alexander Dean	Iowa	Okla.	2833
4663	Wainwright, Lawrence	D. C.	At large	2834
4664	Wallin, Homer Norman	N. Dak.	N. Dak.	2835
4665	Duncan, Donald Bradley	Mich.	Mich.	
4666	Wynne, Sydney Julian	Cal.	Cal.	2836
4667	Muschlitz, Earle Eugene	Pa.	Pa.	2837
4668	Dashiell, Robert Brooke	D. C.	At large	2838
4669	Woodruff, Julian Leveric	N. Y.	N. Y.	2839
4670	Richmond, John O'Donnel	Pa.	Pa.	2840
4671	Fox, David Carl	Pa.	Pa.	2841
4672	Shepard, Andrew Gilbert	Pa.	N. Y.	2842
4673	Fullinwider, Simon Pendleton	Mo.	N. Mex.	2843
4674	Small, Lisle Francis	Iowa	Iowa	2844
4675	Clarke, William Price Oliver	Cal.	Cal.	2845
4676	Caldwell, Edmund Bell	Wash.	Wash.	2846
4677	Allen, Jay K	Okla.	N. Mex.	2847
4678	Vytlacil, Nicholas	Pa.	Ill.	2848
4679	Wooster, Stanton Hall	Conn.	Conn.	2849
4680	Rogers, Edward Brien	Va.	Va.	2850
4681	Howard, George Turner	Ga.	Ga.	
4682	Hayden, Charles Lynn	Wis.	Wis.	2851
4683	Randolph, Robert Lee, Jr	Md.	Md.	2852
4684	Tobin, Robert Gibson	W. Va.	Va.	2853

No.	Name	State in which born	State from which appointed	No. in Grad. Ass'n
4685	Richards, William Pettet	Wash.	Wash.	
4686	Waldschmidt, Theodore Max	Nebr.	S. Dak.	2854
4687	Knowles, Herbert Bain	Maine	Maine	2855
4688	Schneider, Adolph Piening	Wis.	Cal.	2856
4689	Bigelow, Anson Alexander	Ill.	Ill.	2857
4690	Ogg, Robert Rennie	N. Y.	N. Y.	
4691	Tyler, John Cood	Ky.	Ky.	
4692	Sallada, Harold Bushnell	Pa.	Pa.	2858
4693	Buchalter, Benjamin	Mo.	Ind.	2859
4694	Fairlamb, George Richardson, Jr.	Va.	Va.	
4695	Gregory, Joseph Wesley	N. Y.	N. Y.	2860
4696	Marbourg, Edgar Foster	Colo.	Colo.	2861
4697	Cruse, John Roger	Mo.	Mo.	
4698	Metcalf, John Tucker	R. I.	R. I.	
4699	Collins, Ross Forrester	Mo.	Mo.	2862
4700	Staud, Benjamin Franklin	Pa.	Pa.	2863
4701	Shortridge, Paul Fearson	Tex.	Mo.	2864
4702	Denebrink, Francis Compton	Ill.	Wyo.	2865
4703	Twomey, John Joseph	Mass.	Mass.	2866
4704	Stump, Felix Budwell	W. Va.	W. Va.	2867
4705	Matthews, Robert Bowman	D. C.	La.	
4706	Sease, Hugh Saint Clair	S. C.	S. C.	
4707	Calhoun, Walter Carson	Pa.	Pa.	2868
4708	Holden, Carl Frederick	Maine	Maine	2869
4709	Hudson, Lester Jay	D. C.	Cal.	2870
4710	Dunwoody, Kingsland	N. Y.	N. Y.	2871
4711	Brewer, Samuel Bragg	Ala.	Ala.	2872
4712	Moore, Vincent John	Pa.	Pa.	2873
4713	Lively, Frank Wilson	W. Va.	W. Va.	2874
4714	Conyne, James Henry	N. J.	N. J.	
4715	Browne, Davenport	Conn.	Pa.	2875
4716	Neilson, Frederick Winthrop	N. Y.	N. Y.	2876
4717	Irby, Franklin Scott	Va.	Tex.	2877
4718	Price, Allen Ingram	Ohio	Ohio	2878
4719	Hagen, Edward Gillette	N. J.	N. J.	2879
4720	Headlee, Colin De Vere	Wash.	Wash.	2880
4721	Presnell, Byron King	Mo.	Idaho	2881
4722	Steeves, Leland Stanford	Mich.	Mich.	2882
4723	Comstock, Merrill	N. Dak.	N. Dak.	2883
4724	McReynolds, Robert Wing, Jr	Tex.	Tex.	2884
4725	Gruelick, Richard Wetherill	Ind.	Ind.	
4726	Avery, Harrison	Pa.	Pa.	2885
4727	Tevis, Paul Ulysses	Ind.	Ohio	
4728	Doughty, Leonard, Jr	Tex.	Tex.	
4729	Shown, Wilbur Victor	Mo.	Tex.	2886
4730	Ely, Hansen Edward, Jr	Mont.	Iowa	2887

No.	Name	State in which born	State from which appointed	No. in Grad. Ass'n.
4731	Weber, George Karl	Pa.	Pa.	2888
4732	Hyde, Ralph Underhill	N. Y.	N. Y.	2889
4733	Dietrich, William Francis	N. Y.	N. Y.	2890
4734	Wyman, Ralph	Ohio	Wyo.	2891
4735	Harvey, Lawrence	Pa.	Pa.	
4736	Reaves, Andrew Glover	Fla.	Fla.	2892
4737	Cummings, George Clarence	Conn.	Mass.	2893
4738	Harper, Richard Harvey	Tex.	Tex.	2894
4739	Keller, George Monteith	Conn.	Conn.	2895
4740	Heffernan, John Baptist	Ind.	Ind.	2896
4741	Moran, Edward Joseph	Ill.	Ill.	2897
4742	Blodgett, Harry Collins	N. Y.	N. Y.	2898
4743	Keefe, John Henry	Maine	Maine	2899
4744	Senn, Elliott Marchant	Alaska	Miss.	2900
4745	Benson, Francis Wyse	Md.	S. C.	2901
4746	Cooley, Thomas Ross, Jr	Cal.	Cal.	2902
4747	Grant, Vernon Francis	Ill.	Miss.	2903
4748	Harriss, George Latham	N. C.	N. C.	
4749	Spellman, Francis Thomas	Mass.	Mass.	2904
4750	Gale, Thomas Boyle	S. C.	Tenn.	2905
4751	Clark, Homer Webb	N. Y.	N. Y.	
4752	Hansen, Carl Ludwig	S. Dak.	N. Dak.	2906
4753	Sparrow, Edward	N. Y.	Nebr.	2907
4754	Wyatt, Ben Harrison	Ky.	Ky.	2908
4755	Porter, Robert Lee, Jr	Md.	Md.	2909
4756	Davis, Ward Percival	Cal.	Idaho	2910
4757	Forster, Guido Frederick	N. Y.	N. Y.	2911
4758	Clark, Volney Oral	Wyo.	Wyo.	2912
4759	Jones, Edward Harral	Conn.	Pa.	2913
4760	Poindexter, Gale Aylett	Wash.	Wash.	
4761	Morris, Earl William	Ohio	Ohio	
4762	Fleming, Robert Walton	D. C.	La.	2914
4763	Hendley, Thomas Bentley	Tenn.	Tenn.	2915
4764	Morcock, William James	Ga.	Ga.	
4765	Coontz, Kenneth Leo	Cal.	Alaska	2916
4766	Keller, Karl	Pa.	Pa.	2917
4767	Councill, Howard Folk	N. C.	N. C.	2918
4768	Harris, Thomas Field	Ky.	Ky.	2919
4769	Keating, Robert Emmet	Ill.	Ill.	2920
4770	Warren, Philip Wilson	Ill.	Ill.	
4771	Walton, John Newton	Pa.	Pa.	2921
4772	Hurlbut, Earl Schaefer	Kans.	Kans.	
4773	McCann, Allan Rockwell	Mass.	Mass.	2922
4774	Hanson, Evan Greenwood	Utah	Utah	2923
4775	Anderson, Herbert William	Mont.	Mont.	2924

No.	Name	State in which born	State from which appointed	No. in Grad. Ass'n.
4776	Ludlow, William Goodwin, Jr	N. J.	S. Dak.	2925
4777	Brewington, Carl Wright	Tex.	Tex.	2926
4778	Austin, Leonard Bynner	Pa.	Pa.	2927
4779	Holton, Chester McKinley	Ohio	Ohio	2928
4780	Jenkins, John Hayes	Ore.	Wash.	
4781	Wessell, Leonard Paul	N. C.	N. C.	2929
4782	Topp, Emile	N. Y.	N. Y.	2930
4783	Worden, Frank Lyman	Mont.	Mont.	2931
4784	Evans, Donald Rodney	Del.	Del.	
4785	Weis, Frederick Lewis	R. I.	R. I.	2932
4786	Jones, Charles Myers	N. C.	N. C.	2933
4787	Hanafee, Frank Joseph	Ind.	Ind.	2934
4788	Mack, Andrew Robert	N. H.	N. H.	2935
4789	Stone, John Gilbert Marshall	D. C.	Colo.	2936
4790	Skylstead, Ralph Francis	Mont.	Mont.	2937
4791	Ward, Clarence Oliver	Nebr.	Nebr.	2938
4792	Clark, Guy Wheeler	Minn.	Minn.	2939
4793	Ross, Thomas Dashiell	Ky.	Ariz.	
4794	Conover, James Potter, Jr	N. H.	N. Y.	2940
4795	Murphy, John Vernon	Tex.	Tex.	
4796	Smith, Francis Adams	Nebr.	Nebr.	2941
4797	Park, Peyton Hogue	N. C.	N. C.	
4798	Staples, George Bruce	La.	La.	2942
4799	Jacobsen, Conrad Leikness	Ore.	Ore.	2943
4800	Floyd-Jones, Kenneth	N. Y.	N. Y.	2944
4801	Reifel, William McKinley	Ohio	Ohio	2945
4802	Ball, William Hereford	Mo.	Mo.	2946
4803	Sargent, Laurence Prescott	Mass.	Kans.	2949
4804	Cook, Seabury	N. J.	N. J.	
4805	Gover, Lewis Lynn	Ala.	Ala.	2948
4806	Schofield, Albert Richardson	Pa.	Pa.	2949
4807	Perkins, Constantine Nicholas	Cal.	Cal.	2950
4808	Failing, Rollin Van Alstine	Mich.	Mich.	2951
4809	Wells, Benjamin Osborne	Wis.	Wis.	2952
4810	Kelly, Laurence Edward	Pa.	Pa.	2953
4811	Jackson, Herbert Wiley	Kans.	Kans.	2954
4812	Spencer, Douglas Ancrum	S. C.	N. C.	2955
4813	Bartholdi, John Joseph	Ariz.	Ariz.	2956
4814	Weitzel, Charles William	Pa.	Colo.	2957
4815	Ely, Harold Faul	Pa.	Pa.	2958
4816	Lehrfeld, Isadore	N. Y.	N. Y.	2959
4817	Dillon, Stephen Edwin	Ark.	Ark.	2960
4818	Forshew, John Hildreth, Jr	N. Y.	N. Y.	2961
4819	Claude, William Shepard Bryan	Md.	Okla.	2962
4820	Heath, William Shannon	S. C.	S. C.	2963

No.	Name	State in which born	State from which appointed	No. in Grad. Ass'n.
4821	Elmore, Willett	Ala.	Ala.	2964
4822	Hoover, Guy Bashford	Ohio	Ohio	2965
4823	Hoeffel, Kenneth Mortimer	Wis.	Wis.	2966

All of "date of 1913" have been commissioned into the service as ensign, with the following exceptions:

SECOND LIEUTENANT U. S. MARINE CORPS

4685	Richards, W. P.	4750	Gale, T. B.	4805	Gover, L. L.
4700	Staud, B. F.	4768	Harris, T. F.	4821	Elmore, W.
4719	Hagen, E. G.	4786	Jones, C. M.		

ASSISTANT PAYMASTER

4696	Marbourg, E. F.	4722	Steeves, L. S.	4806	Schofield, A. R.

4798 Staples, G. B. Res., Mar. 29, '17, Mid.

NOTICE

The U. S. Naval Institute was established in 1873, having for its object the advancement of professional and scientific knowledge in the Navy. It is now in its forty-fourth year of existence, trusting as heretofore for its support to the officers and friends of the Navy. The members of the Board of Control cordially invite the co-operation and aid of their brother officers and others interested in the Navy, in furtherance of the aims of the Institute, by the contribution of papers and communications upon subjects of interest to the naval profession, as well as by personal support and influence.

On the subject of membership the Constitution reads as follows:

ARTICLE VII

Sec. 1. The Institute shall consist of regular, life, honorary and associate members.

Sec. 2. Officers of the Navy, Marine Corps, and all civil officers attached to the Naval Service, shall be entitled to become regular or life members, without ballot, on payment of dues or fees to the Secretary and Treasurer. Members who resign from the Navy subsequent to joining the Institute will be regarded as belonging to the class described in this Section.

Sec. 3. The Prize Essayist of each year shall be a life member without payment of fee.

Sec. 4. Honorary members shall be selected from distinguished Naval and Military Officers, and from eminent men of learning in civil life. The Secretary of the Navy shall be, *ex officio*, an honorary member. Their number shall not exceed thirty (30). Nominations for honorary members must be favorably reported by the Board of Control, and a vote equal to one-half the number of regular and life members, given by proxy or presence, shall be cast, a majority electing.

Sec. 5. Associate members shall be elected from Officers of the Army, Revenue Cutter Service, foreign officers of the Naval and Military professions, and from persons in civil life who may be interested in the purposes of the Institute.

Sec. 6. Those entitled to become associate members may be elected life members, provided that the number not officially connected with the Navy and Marine Corps shall not at any time exceed one hundred (100).

Sec. 7. Associate members and life members, other than those entitled to regular membership, shall be elected as follows: "Nominations shall be made in writing to the Secretary and Treasurer, with the name of the member making them, and such nominations shall be submitted to the Board of Control, and, if their report be favorable, the Secretary and Treasurer shall make known the result at the next meeting of the Institute, and a vote shall then be taken, a majority of votes cast by members present electing."

Sec. 8. The annual dues for regular and associate members shall be two dollars, all of which shall be for a year's subscription to the UNITED STATES NAVAL INSTITUTE PROCEEDINGS, payable upon joining the Institute, and upon the first day of each succeeding January. The fee for life membership shall be thirty dollars, but if any regular or associate member has paid his dues for the year in which he wishes to be transferred to life membership, or has paid his dues for any future year or years, the amount so paid shall be deducted from the fee for life membership.

ARTICLE X

Sec. 2. One copy of the PROCEEDINGS, when published, shall be furnished to each regular and associate member (in return for dues paid), to each life member (in return for life membership fee paid), to honorary members, to each corresponding society of the Institute, and to such libraries and periodicals as may be determined upon by the Board of Control.

The PROCEEDINGS are published monthly; subscription for non-members, $3.00; enlisted men, U. S. Navy, $2.00. Single copies, by purchase, 30 cents; issues preceding January, 1917, 50 cents.

All letters should be addressed U. S. Naval Institute, Annapolis, Md., and all checks, drafts, and money orders should be made payable to the same.

SPECIAL NOTICE

NAVAL INSTITUTE PRIZE ESSAY, 1918

A prize of two hundred dollars, with a gold medal, and a life-membership (unless the author is already a life member) in the Institute, is offered by the Naval Institute for the best essay presented on any subject pertaining to the naval profession.

On the opposite page are given suggested topics. Essays are not limited to these topics and no additional weight will be given an essay in awarding the prize because it is written on one of these suggested topics over one written on any subject pertaining to the naval profession.

The following rules will govern this competition:

1. The award for the prize will be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.

2. Each competitor to send his essay in a sealed envelope to the Secretary and Treasurer on or before January 1, 1918. The name of the writer shall not be given in this envelope, but instead thereof a motto. Accompanying the essay a separate sealed envelope will be sent to the Secretary and Treasurer, with the motto on the outside and writer's name and motto inside. This envelope is not to be opened until after the decision of the Board.

3. The successful essay to be published in the PROCEEDINGS of the Institute; and the essays of other competitors, receiving honorable mention, to be published also, at the discretion of the Board of Control; and no change shall be made in the text of any competitive essay, published in the PROCEEDINGS of the Institute, after it leaves the hands of the Board.

4. If, in the opinion of the Board of Control, the best essay presented is not of sufficient merit to be awarded the prize, it may receive "Honorable Mention" or such other distinction as the Board may decide.

5. In case one or more essays receive "Honorable Mention," the writers thereof will receive a minimum prize of seventy-five dollars and a life-membership (unless the author is already a life member) in the Institute, the actual amounts of the awards to be decided by the Board of Control in each case.

6. An essay not having received honorable mention may be published also, at the discretion of the Board of Control, but only with the consent of the author.

7. The essay is limited to fifty (50) printed pages in the PROCEEDINGS of the Institute.

8. It is requested that all essays be submitted typewritten and in duplicate, if practicable; essays submitted written in longhand and in single copy will, however, receive equal consideration.

9. In the event of the prize being awarded to the winner of a previous year, a gold clasp, suitably engraved, will be given in lieu of the gold medal.

By direction of the Board of Control.

J. W. GREENSLADE,
Commander, U. S. N., Secretary and Treasurer

PRIZE ESSAY TOPICS

SUGGESTED AT THE INVITATION OF THE BOARD OF CONTROL

BY

THE PRESIDENT OF THE NAVAL INSTITUTE, THE SUPERINTENDENT OF THE NAVAL ACADEMY, THE PRESIDENT OF THE NAVAL WAR COLLEGE, AND THE COMMANDERS-IN-CHIEF OF THE ATLANTIC, PACIFIC AND ASIATIC FLEETS.

"The Mutual Relations of Gunnery and Tactics."

"The Place of the Naval Officer in International Affairs."

"The Evolution of Naval Doctrine from National Character."

"The Training of Enlisted Personnel to Produce Modern Man-o'-Warsmen: (a) Military Training; (b) Moral Training; (c) Education."

"The Organization, Employment and Training of Reserve Fleets and Flotillas."

"A Personnel Reserve for the Naval Service."

"Value of Speed as an Offensive Element in Battleship Strategy and Tactics, as Compared with Armor."

LIST OF PRIZE ESSAYS

"WHAT THE NAVY HAS BEEN THINKING ABOUT"

1879

Naval Education. Prize Essay, 1879. By Lieut. Commander A. D. Brown, U. S. N.

NAVAL EDUCATION. First Honorable Mention. By Lieut. Commander C. F. Goodrich, U. S. N.

NAVAL EDUCATION. Second Honorable Mention. By Commander A. T. Mahan, U. S. N.

1880

"The Naval Policy of the United States." Prize Essay, 1880. By Lieutenant Charles Belknap, U. S. N.

1881

The Type of (I) Armored Vessel, (II) Cruiser Best Suited to the Present Needs of the United States. Prize Essay, 1881. By Lieutenant E. W. Very, U. S. N.

SECOND PRIZE ESSAY, 1881. By Lieutenant Seaton Schroeder, U. S. N.

1882

Our Merchant Marine: The Causes of Its Decline and the Means to Be Taken for Its Revival. "Nil clarius aquis." Prize Essay, 1882. By Lieutenant J. D. Kelley, U. S. N.

"MAIS IL FAUT CULTIVER NOTRE JARDIN." Honorable Mention. By Master C. G. Calkins, U. S. N.

"SPERO MELIORA." Honorable Mention. By Lieut. Commander F. E. Chadwick, U. S. N.

"CAUSA LATET: VIS EST NOTISSIMA." Honorable Mention. By Lieutenant R. Wainwright, U. S. N.

1883

How May the Sphere of Usefulness of Naval Officers Be Extended in Time of Peace with Advantage to the Country and the Naval Service? "Pour encourager les Autres." Prize Essay, 1883. By Lieutenant Carlos G. Calkins, U. S. N.

"SEMPER PARATUS." First Honorable Mention. By Commander N. H. Farquhar, U. S. N.

"CULIBET IN ARTE SUA CREDENDUM EST." Second Honorable Mention. By Captain A. P. Cooke, U. S. N.

1884

The Reconstruction and Increase of the Navy. Prize Essay, 1884. By Ensign W. I. Chambers, U. S. N.

1885

Inducements for Retaining Trained Seamen in the Navy, and Best System of Rewards for Long and Faithful Service. Prize Essay, 1885. By Commander N. H. Farquhar, U. S. N.

1886

What Changes in Organization and Drill Are Necessary to Sail and Fight Effectively Our Warships of Latest Type? "Scire quod nescias." Prize Essay, 1886. By Lieutenant Carlos G. Calkins, U. S. N.

THE RESULT OF ALL NAVAL ADMINISTRATION AND EFFORTS FINDS ITS EXPRESSION IN GOOD ORGANIZATION AND THOROUGH DRILL ON BOARD OF SUITABLE SHIPS. Honorable Mention. By Ensign W. L. Rodgers, U. S. N.

1887

The Naval Brigade: Its Organization, Equipment and Tactics. "In hoc signo vinces." Prize Essay, 1887. By Lieutenant C. T. Hutchins.

1888

Torpedoes. Prize Essay, 1888. By Lieut. Commander W. W. Reisinger, U. S. N.

1891

The Enlistment, Training and Organization of Crews for Our Ships of War. Prize Essay, 1891. By Ensign A. P. Niblack, U. S. N.

DISPOSITION AND EMPLOYMENT OF THE FLEET: SHIP AND SQUADRON DRILL. Honorable Mention, 1891. By Lieutenant R. C. Smith, U. S. N.

1892

Torpedo-boats: Their Organization and Conduct. Prize Essay, 1892. By Wm. Laird Clowes.

1894

The U. S. S. Vesuvius, with Special Reference to Her Pneumatic Battery. Prize Essay, 1894. By Lieut. Commander Seaton Schroeder, U. S. N.

NAVAL REFORM. Honorable Mention, 1894. By Passed Assistant Engineer F. M. Bennett, U. S. N.

1895

Tactical Problems in Naval Warfare. Prize Essay, 1895. By Lieut. Commander Richard Wainwright, U. S. N.

A SUMMARY OF THE SITUATION AND OUTLOOK IN EUROPE. An Introduction to the Study of Coming War. Honorable Mention, 1895. By Richmond Pearson Hobson, Assistant Naval Constructor, U. S. N.

SUGGESTIONS FOR INCREASING THE EFFICIENCY OF OUR NEW SHIPS. Honorable Mention, 1895. By Naval Constructor Wm. J. Baxter, U. S. N.

THE BATTLE OF THE YALU. Honorable Mention, 1895. By Ensign Frank Marble, U. S. N.

1896

The Tactics of Ships in the Line of Battle. Prize Essay, 1896. By Lieutenant A. P. Niblack, U. S. N.

THE ORGANIZATION, TRAINING AND DISCIPLINE OF THE NAVY PERSONNEL AS VIEWED FROM THE SHIP. Honorable Mention, 1896. By Lieutenant Wm. F. Fullam, U. S. N.

NAVAL APPRENTICES, INDUCEMENTS, ENLISTING AND TRAINING. The Seaman Branch of the Navy. Honorable Mention, 1896. By Ensign Ryland D. Tisdale, U. S. N.

THE COMPOSITION OF THE FLEET. Honorable Mention, 1896. By Lieutenant John M. Ellicott, U. S. N.

1897

Torpedo-boat Policy. Prize Essay, 1897. By Lieutenant R. C. Smith, U. S. N.

A PROPOSED UNIFORM COURSE OF INSTRUCTION FOR THE NAVAL MILITIA. Honorable Mention, 1897. By H. G. Dohrman, Associate Member, U. S. N. I.

TORPEDOES IN EXERCISE AND BATTLE. Honorable Mention, 1897. By Lieutenant J. M. Ellicott, U. S. N.

1898

Esprit de Corps: A Tract for the Times. Prize Essay, 1898. By Captain Caspar Frederick Goodrich, U. S. N.

OUR NAVAL POWER. Honorable Mention, 1898. By Lieut. Commander Richard Wainwright, U. S. N.

TARGET PRACTICE AND THE TRAINING OF GUN CAPTAINS. Honorable Mention, 1898. By Ensign R. H. Jackson, U. S. N.

1900

Torpedo Craft: Types and Employment. Prize Essay, 1900. By Lieutenant R. H. Jackson, U. S. N.

THE AUTOMOBILE TORPEDO AND ITS USES. Honorable Mention, 1900. By Lieutenant L. H. Chandler, U. S. N.

1901

Naval Administration and Organization. Prize Essay, 1901. By Lieutenant John Hood, U. S. N.

1903

Gunnery in Our Navy. The Causes of Its Inferiority and Their Remedies. Prize Essay, 1903. By Professor Philip R. Alger, U. S. N.

A NAVAL TRAINING POLICY AND SYSTEM. Honorable Mention, 1903. By Lieutenant James H. Reid, U. S. N.

SYSTEMATIC TRAINING OF THE ENLISTED PERSONNEL OF THE NAVY. Honorable Mention, 1903. By Lieutenant C. L. Hussey, U. S. N.

OUR TORPEDO-BOAT FLOTILLA. The Training Needed to Insure Its Efficiency. Honorable Mention, 1903. By Lieutenant E. L. Beach, U. S. N.

1904

The Fleet and Its Personnel. Prize Essay, 1904. By Lieutenant S. P. Fullinwider, U. S. N.

A PLEA FOR A HIGHER PHYSICAL, MORAL AND INTELLECTUAL STANDARD OF THE PERSONNEL FOR THE NAVY. Honorable Mention, 1904. By Medical Inspector Howard E. Ames, U. S. N.

1905

American Naval Policy. Prize Essay, 1905. By Commander Bradley A. Fiske, U. S. N.

THE DEPARTMENT OF THE NAVY. Honorable Mention, 1905. By Rear Admiral Stephen B. Luce, U. S. N.

1906

Promotion by Selection. Prize Essay, 1906. By Commander Hawley O. Rittenhouse, U. S. N.

THE ELEMENTS OF FLEET TACTICS. First Honorable Mention, 1906. By Lieut. Commander A. P. Niblack, U. S. N.

GLEANINGS FROM THE SEA OF JAPAN. Second Honorable Mention, 1906. By Captain Seaton Schroeder, U. S. N.

THE PURCHASE SYSTEM OF THE NAVY. Third Honorable Mention, 1906. By Pay Inspector J. A. Mudd, U. S. N.

1907

Storekeeping at the Navy Yards. Prize Essay, 1907. By Pay Inspector John A. Mudd, U. S. N.

BATTLE REHEARSALS. A Few Thoughts on Our Next Step in Fleet-Gunnery. First Honorable Mention, 1907. By Lieut. Commander Yates Stirling, U. S. N.

THE NAVAL PROFESSION. Second Honorable Mention, 1907. By Commander Bradley A. Fiske, U. S. N.

1908

A Few Hints to the Study of Naval Tactics. Prize Essay, 1908. By Lieutenant W. S. Pye, U. S. N.

THE MONEY FOR THE NAVY. First Honorable Mention, 1908. By Pay Inspector John A. Mudd, U. S. N.

THE NATION'S DEFENCE—THE OFFENSIVE FLEET. How Shall We Prepare It for Battle? Second Honorable Mention, 1908. By Lieut. Commander Yates Stirling, U. S. N.

1909

Some Ideas about Organization on Board Ship. Prize Essay, 1909. By Lieutenant Ernest J. King, U. S. N.

THE NAVY AND COAST DEFENCE. Honorable Mention, 1909. By Commodore W. H. Beehler, U. S. N.

THE REORGANIZATION OF THE NAVAL ESTABLISHMENT. Honorable Mention, 1909. By Pay Inspector J. A. Mudd, U. S. N.

A PLEA FOR PHYSICAL TRAINING IN THE NAVY. Honorable Mention, 1909. By Commander A. P. Niblack, U. S. N.

1910

The Merchant Marine and the Navy. Prize Essay, 1910. By Naval Constructor T. G. Roberts, U. S. N.

THE NAVAL STRATEGY OF THE RUSSO-JAPANESE WAR. Honorable Mention, 1910. By Lieutenant Lyman A. Cotton, U. S. N.

1911

Navy Yard Economy. Prize Essay, 1911. By Paymaster Charles Conrad, U. S. N.

NAVAL POWER. Honorable Mention, 1911. By Captain Bradley A. Fiske, U. S. N.

WANTED—FIRST AID. Honorable Mention, 1911. By Commander C. C. Marsh, U. S. N.

1912

Naval Might. Prize Essay, 1912. By Lieutenant Ridgely Hunt, U. S. N. (retired).

INSPECTION DUTY AT THE NAVY YARDS. Honorable Mention, 1912. By Lieut. Commander T. D. Parker, U. S. N.

1913

The Greatest Need of the Atlantic Fleet. Prize Essay, 1913. By Lieut. Commander Harry E. Yarnell, U. S. N.

NAVY DEPARTMENT ORGANIZATION. A Study of Principles. First Honorable Mention, 1913. By Commander Yates Stirling, Jr., U. S. N.

TRAINED INITIATIVE AND UNITY OF ACTION. Second Honorable Mention, 1913. By Lieut. Commander Dudley W. Knox, U. S. N.

1914

The Great Lesson from Nelson for To-day. Prize Essay, 1914. By Lieut. Commander Dudley W. Knox, U. S. N.

NAVAL POLICY AS IT RELATES TO THE SHORE ESTABLISHMENT AND THE MAINTENANCE OF THE FLEET. Honorable Mention, 1914. By Captain John Hood, U. S. N.

OLD PRINCIPLES AND MODERN APPLICATIONS. Honorable Mention, 1914. By Lieut. Commander Dudley W. Knox, U. S. N.

MILITARY PREPAREDNESS. Honorable Mention, 1914. By Naval Constructor Richard D. Gatewood, U. S. N.

1915

The Rôle of Doctrine in Naval Warfare. Prize Essay, 1915. By Lieut. Commander Dudley W. Knox, U. S. N.

AN AIR FLEET: OUR PRESSING NAVAL WANT. First Honorable Mention, 1915. By Lieut. Commander Thomas Drayton Parker, U. S. N.

TACTICS. Second Honorable Mention, 1915. By Ensign H. H. Frost, U. S. N.

DEFENCE AGAINST SURPRISE TORPEDO ATTACK. Third Honorable Mention, 1915. By Ensign R. T. Merrill, 2d, U. S. N.

1916

The Moral Factor in War. Prize Essay, 1916. By Lieutenant (J. G.) H. H. Frost, U. S. N.

NAVAL PERSONNEL. First Honorable Mention, 1916. By Lieut. Commander J. K. Taussig, U. S. N.

EDUCATION AT THE U. S. NAVAL ACADEMY. Second Honorable Mention, 1916. By Lieutenant Ridgely Hunt, U. S. N.

SOME UNDERLYING PRINCIPLES OF MORALE. Third Honorable Mention, 1916. By Commander Dudley W. Knox, U. S. N.

LARGE *vs.* A GREATER NUMBER OF SMALLER BATTLESHIPS. Lippincott Prize Essay. By Lieut. Commander Thomas Lee Johnson, U. S. N.

1917

Commerce Destroying in War. Prize Essay, 1917. By Commander Lyman A. Cotten, U. S. Navy.

THE PEOPLE'S RÔLE IN WAR. First Honorable Mention, 1917. By Lieutenant H. H. Frost, U. S. Navy.

THE NATION'S GREATEST NEED. Second Honorable Mention, 1917. By Colonel Dion Williams, U. S. Marine Corps.